CCCESD – REVIEW OF DEPARTMENTS – 2011

Department of Earth Sciences, Dalhousie University

Status Report: Dalhousie Earth Sciences is under new management, with a new Chair (R. Jamieson) and Administrator (A. Bannon); we are actively planning for the future as best we can in fiscally tight times. Since July 1, two faculty have joined the department, one transferred from Environmental Science (S. Sterling) and a new Instructor (R. Cox, teaching relief for Jamieson) who is teaching Mineralogy and some Petrology classes and labs. We also anticipate appointing an Industrial Research Chair in Salt and Continental Margin Tectonics during the 2012-13 academic year (application to NSERC pending). Nevertheless, with current faculty numbers at 12 Professors (all levels) and 5 Instructors (all levels), we remain one of the smaller Earth Sciences departments in the country to offer a full graduate programme.

Our undergraduate student numbers are approximately the same as last year, with 30-35 students in each of our core second-year classes, 20-30 in third year, and 16-18 honours students planning to complete theses in spring 2012. Our honours graduates currently qualify for professional registration in the CCPG Geology and Environmental Geoscience streams. In Sept. 2011 we began a series of much-needed changes to our field schools (yrs 2-4) and we are also reviewing other aspects of our curriculum. Enrolment in service classes continues to be high, especially in our Geography classes (Dalhousie does not have a Geography department), so that although we are below our ideal capacity, we have maintained our overall student numbers relative to those of other departments in the Faculty of Science. Employment numbers for students completing years 2-4 were excellent in 2011, up considerably from the previous year.

We currently have 31 graduate students (22 Ph.D. and 9 M.Sc.), with several of these (co-) supervised by Adjunct faculty from other departments in Nova Scotia or by colleagues in other Dalhousie departments. Over 90% of our current M.Sc. students are Canadian; in contrast, almost 40% of our Ph.D. students are non-Canadian. The numbers are typical of the past few years, but below our ideal capacity; a major limitation is funding, as addressed further below.

Future Directions: Our November 2011 report to the Faculty of Science included a Strategic Plan in which we identified two possible future directions that would build on and extend our existing strengths into areas where new opportunities have arisen through technical or intellectual advances and/or interdisciplinary approaches. The first, Ocean Margin Processes, represents a theme of enormous importance for society worldwide, and falls squarely within the sphere of ocean research for which Dalhousie is known internationally and to which the Department has made strong contributions over many years; it is also a natural outgrowth of our current strength in Surface and Quaternary Processes. The second, Deep Earth Processes, represents an area of fundamental research into lower crust and mantle lithosphere interactions that has lately become feasible through developments in technology and improvements in experimental and numerical modeling methods; this would build on our existing expertise in Tectonic Processes.

Challenges: In the same report we identified several challenges facing our department if we are to achieve our goals and maintain or improve our profile and performance in the next decade. In addition to space (specific to our own situation), the list included several topics that are probably faced by many other Earth Science departments across the country.

a) Graduate student funding: Dalhousie has very limited funding for graduate students, reflecting the combined effects of a small scholarship allocation, TAs linked to an hourly rate specified by CUPE (typically $3600/yr maximum), and very high tuition, especially for foreign students ($8600 for MSc, $8900 for PhD, $5346 differential fee for non-Canadians in 2011-12). Full tuition for Canadian students is now >40% of the amounts available from NSERC PGS-M and PGS-D scholarships; tuition waivers are generally not possible. Except for externally funded students, most of the stipend comes from our NSERC Discovery Grants or other research funds (average $10000/y/student, range $2000-20000/yr depending on programme and nationality). Even students on external scholarships generally require some support from their supervisors to cover tuition; under these circumstances, most supervisors cannot fund more than one student/yr without access to significant other resources.

b) NSERC Discovery Grants: Mastering the new NSERC Discovery Grant funding model is proving difficult for many Earth Science researchers. At Dalhousie, despite significant increases to some individuals, the average grant remains low, ca. $32000/y (almost exactly the same as in 2004), and many excellent researchers with traditional field-based programmes have seen significant decreases in funding. With HQP weighted equally with the merit of the proposal and the merit of the researcher, success in Discovery Grant applications is inextricably linked to successful recruitment and supervision of graduate students, which poses a huge problem for Dalhousie faculty in all disciplines because of the funding limitations noted above. The other main challenge is to demonstrate “innovation” in areas where the methods may be both conventional and expensive (e.g., field work in remote areas).

c) Research facilities renewal: Dalhousie Earth Sciences faces two different kinds of challenges with respect to maintaining and improving our research facilities -

funding and space (the latter specific to the Dalhousie situation). Some of our most heavily used instruments (e.g., electron microprobe, noble-gas mass spectrometer) will need to be replaced in the next 5-10 years (likely replacement costs $1-2M). Finding the funds to replace aging instruments or to set up new facilities to support new research directions will present a very serious challenge. The most likely source of funds is CFI, but successful applications must meet very high standards for innovation and chronic delays in receiving provincial matching funds could well lead to significant disruptions in continuity of service to the research communities involved. Changes in the criteria for the NSERC Major Resources Support programme, especially the decision to stop funding regional facilities, are likely to have a detrimental effect on our chances of success with future MRS and equipment proposals. This is unfortunate because researchers at the small universities in the Atlantic region have benefited enormously from the opportunity to share costly research equipment and other infrastructure.

d) Enrolment: Although we are maintaining our undergraduate student numbers, overall enrolment in Dalhousie Earth Sciences is below capacity, with 60-80 students in years 2-4 over the last several years (ca. 100 possible with present resources). Once students enter second year, our retention rate is good, with 10-20 students/year completing honours degrees. The problem is to recruit more students into mainstream first-year classes, and from there into the core second-year classes. Our main advantages have been small class sizes, personal attention from instructors, good rapport among students and between students and faculty, field work opportunities, and good employment prospects. However, pressure to increase enrolment may work against some of these factors and will certainly stress our already stretched resources. We plan to improve our outreach efforts (e.g., revamp the website, get more involved in high schools) and are exploring innovative teaching methods with the goals of reaching a larger audience and engaging students at an earlier stage.

e) Faculty and staff renewal: Dalhousie Earth Sciences is a small department by Canadian standards. While we can maintain the strong foundation programme needed for our students to meet professional registration requirements, we are now at the lower limit of critical mass needed to maintain competitive graduate and research programmes. Although numbers and timing are difficult to predict precisely, it is likely that 5 faculty members will retire in the next 5-10 years. Replacing these individuals is essential because we simply cannot afford to drop below our present strength (12 professors + 5 instructors). In the long term we would like to grow to the national average (ca. 19 professors + 3 instructors) in order to take advantage of new and emerging directions in Earth Sciences while maintaining our core strengths. Unfortunately, the current funding climate at Dalhousie does not offer much opportunity for growth in the near future. While long-term strategies for maintaining and increasing our faculty numbers are being considered, in the short term we need to improve the teaching and research effectiveness of our existing personnel. In addition, recent and impending retirements of technical staff (including thin section and mass spectrometry technologists) will also have a serious detrimental effect on our programmes if these individuals are not replaced.

Geology Department, Saint Mary's University

New provincial policies regarding University subsidies in Nova Scotia have resulted in a state of panic regarding budget, and we have therefore been (and will probably be for a while) unsuccessful in our attempts to increase our allotment by one half-position through the hiring of a cross-appointment with our Environmental Science Program. However, with the reshuffling and rationalization of resources that ensued, we have managed to acquire an additional half-time technician position in exchange for a diversification of the duties of our departmental secretary, who now devotes only 60% of her time to matters of the Geology Department. We are still at the interview stage regarding the new hiring, which we are planning to top-up with instructor contracts for our intro labs.

In terms of undergraduate enrollment, we are now experiencing a minor increase, in large part because of a new Geology requirement in our Engineering Program. Our graduate enrollment has been relatively steady.

A new School of the Environment was recently formed at Saint Mary's, which includes a pre-existing BSc in Environmental Science (formerly Environmental Studies), pre-existing BSc and BA programs in Geography, and a new Bachelor of Environmental Studies (B.E.S.). Although the Geology Department took a leading role in establishing the BSc program two decades ago, it was not strongly involved in the establishment of the new School, which we fear will have a diluting effect on enrollment.

Regarding the concerns over NSERC's policy changes of the last few years, we had one well-established and productive researcher/HQP trainer in our department who saw his/her Discovery Grant renewed but decreased last Spring, and one moderately established and productive researcher (me..., Pierre Jutras) who decided not to apply for his third 5-year term, despite a relatively competitive scholarship. Hence, when looking at the statistical implications of NSERC's new policies, we not only have to consider failed vs successful applications, but also non-renewed applications from individuals who don't want to be forced into the industrial HQP training of students (most of whom shouldn't be doing graduate studies in the first place). In five years, we went from 5/5 NSERC-funded faculty members to 2/5, plus one funded Emeritus.

Earth and Environmental Science, Acadia University

After three years of significant enrolment increases in Science, but non-replacement of retiring/departing faculty, the effects are now becoming very obvious at Acadia. Classes are larger, elective options are fewer, or offered less often, and supervisory load for thesis/project courses is very high.

The E&ES Department is now has the second largest enrolment in Science with 120 majors split equally between Geology and Environmental Science programs, and thanks to large service courses sees well over half of all students at Acadia taking a course in Geology. However, one retirement from the Environmental Science side has resulted in downsizing of faculty to 6 + 1 instructor, and considerable reshuffling of teaching and administrative responsibilities. Although positions have decreased, operating budgets have so far remained intact.

A review of the Environmental Science program was completed last winter, achieving accreditation with ECO. It did require several program modifications, in areas of policy and mineralogy. The Geology program will be reviewed in the next year.

University of New Brunswick

1) We changed our name to Earth Sciences in Feb 2011.
2) We opened our new Quartermain Earth Sciences Centre in October. The centre comprises a new teaching lab, museum and updated computer and graduate space.
3) We received a $500 K donation from Graham Farquharson of Strathcona minerals - this is being used to purchase new microscopes and renovate teaching space.
4) Undergraduate numbers are up about 15% compared to the last three years. Graduate numbers are stable.
5) Budget cuts continue to be an issue at UNB and various scenarios of faculty amalgamation are being explored.

Université du Québec à Chicoutimi (UQAC) – Département de Sciences

Appliquées (engineering department) – secteur sciences de la terre. Michael D Higgins, director of teaching.

Staff : Our sector now has 9 full-time staff, which corresponds to 7 teaching staff, 3 sessional lecturers and 3 PDFs. Jacques Carignan retired this year and was replaced by Paul Bedard in geochemistry. We also recruited Ali Saedi to teach rock and soil mechanics.

Students: We have 40 students in our geology BSc, 60 in the engineering geology BSc, 27 MSc and 16 PhD students. A significant proportion of our graduate students are from France.

Research: The biggest research groups are in economic and exploration geology. Sarah Barnes has a 'Create' network node. Real Daigneault has received a major grant from 'Economic Development Canada' for the Consortium de recherche en exploration minérale (CONSOREM). Our hydrogeology group is expanding fast and has a large provincial and municipal funded groundwater project (PACES).

Equipment: Sarah Barnes has just acquired a new ICP-MS-Laser ablation system.

Université Laval - 2011

There has been no change of personnel in the department and we remain at 12 faculty members. Student enrolment in our two undergraduate programs, geology and geological engineering, has remained similar compared to last year, with about 100-110 students currently enrolled. Geological engineering still remains the most popular undergraduate program with about three quarters of all undergraduate students. Our geology program has undergone a formal evaluation this past Winter and the external review was positive but we do have to address some concerns that were noted by the reviewers. As is often the case with program evaluations, concerns relate to the lack of coverage of some topics in the program, which is in turn related to the limited human resources for a small department. Hiring new Faculty would of course be the best way to address these concerns and we are looking at the various ways to do that, including outside funding to apply for Research Chairs.

At the graduate level, our enrollment has increased both at the MSc and PhD levels, which is very good news for our department. In comparison to other departments in the Faculty of Science and Engineering at Laval, we are still slightly below the average number of graduate students supervised by faculty, but we are progressing towards the top. We are maintaining our efforts to increase our number of graduate students, for example by redesigning our departmental web page which is planned in the coming year.

McGill University, Montreal

Our undergraduate numbers at McGill are stable, and we have seen a rise in graduate students this year. We welcomed two new professors this year: Christie Rowe, the inaugural Wares Scholar in Economic Geology, whose research is on fluids in fault zones, and Yajing Liu, a seismologist who studies the origin of episodic tremor and slip events. A second Osisko-Wares Scholar, Vincent van Hinsberg, arrives in January. Andrew Hynes

University of Ottawa

Undergraduate enrolment (09/11; French and English; years 1 to 4):

- Honours in geology: Total = 52; French 22 (1, 8, 7, 6); English 30 (4, 9, 6, 11)
- Major in geology : Total = 29; French 9 (5, 0, 1, 3); English 20 (6, 6, 5, 3)

- Honours in Geology-Physics : Total = 11; French 1 (1, 0, 0, 0); English 10 (2, 4, 1, 3)
- Honours in environmental sciences: Total = 140; French 33 (5, 11, 5, 12); English 107 (22, 26, 27, 32)

Graduate and PDF enrolment (09/11)

- M Sc : 27
- Ph D : 18
- PDF : 4

Department profile

Two new full-time professors at the assistant level have been hired by the department in 2011; Pascal Audet, a geophysicist interested in the rheology, structure and evolution of the lithosphere, and Jonathan O'Neil, an igneous petrologist interested in the formation of the primitive crust. Jack Cornett, a recently appointed CRC Tier 1 in Accelerator Mass Spectroscopy, will also join the department in 2012.

- 16 regular full-time professors
- 14 adjunct professors
- 2.5 administrative support staff
- 1 teaching lab manager
- 10 technical support staff

Accelerator Mass Spectrometry (AMS) Facility

The uOttawa approved the construction of a new $36M research building (shared with photonics) to house the $21M CFI-funded AMS research center and existing and new research laboratories for the department including:

- New AMS from HVEE for ^{14}C, radio halides...
- New stable Isotope Mass Spec and accessories for the G.G. Hatch Lab
- Two new Noble gas Mass Specs for our MAPL Noble Gas Lab
- New JEOL 8230 electron microprobe fitted with five WDS spectrometers and a high count-rate silicon drift detector EDS spectrometer
- New JEOL 6610LV SEM with Oxford INCA large area SDD detector and CL detector
- New Element XR magnetic sector ICP-MS with Eximer ablation laser
- New Agilent 7700 quadrupole ICP-MS
- New cathodoluminescence microscopy facility

Queen's University, Dept Geological Sciences & Geological Engineering

Geological Sciences and Geological Engineering at Queen's University

- Very positive review by the visitor during the CEAB fall site visit. No deficiencies were noted in the exit interview.
- Continuing Adjunct Professor Rob Harrap has been added to the faculty complement.
- The Queen's University Principal's Innovation Fund has allocated a base budget funded Applied Geophysics position to the Department. Interviews are about to get underway, and it is hoped that a candidate will be hired for July 1, 2012.
- Geological Engineering enrollment has stayed high (45 in 2nd year), while Geological Science enrollment has dropped (30 in 2nd year). This is more acceptable to the Department than last year's numbers - with 96 students at our field school last spring, we were stretched very thin.
- The Queen's Facility for Isotopic Research (QFIR) Laboratory's Environmental SEM and Microprobe are now functional. This equipment and more was funded by CFI.
- Queen's University is moving to a different budgeting model under the direction of the new Provost which will hopefully reward the department for all of our efforts, but which will fundamentally change the budgeting process - hopefully for the better.
- Room renovations, funded by alumni donations, have started. The "Dr. Richard Milne Geoscience Education Room" was opened last week, and will provide a dedicated space for Museum outreach activities. The "Dr Ray Price Teaching Laboratory" will be opened in the spring.
- The operational budget has shrunk to the point where it includes only the salaries of term adjuncts and TAs. We have worked hard to reduce our TA budget either by going to labs every other week or by expanding the amount of group-based, multi-week projects. Despite this, only 34% of our TA budget is supplied by the Faculty Office. The balance of the funding has to come from trust funds or monies donated by companies or alumni; donations now fund over a third of our TA budget. This is not sustainable in the long term, so it is hoped that the new budget model will help us.
- Another source of budget cuts is our inability to attract the same balance of graduate students as was the case in 2005. We have the same number of domestic graduate students as we had in 2005, but now the group is predominantly masters students. Maintaining this number, while having 14% fewer faculty is admirable in our opinion, but given the details of the Ontario gov't Reaching Higher program, and the fact that the balance was almost 50% Ph.D. students in 2005, we are now facing a budget cut that wipes out the non-salary base budget allocation.
- Our numerous field schools and field trips are fully funded by either the student trip fees or from our endowed Field Education Fund (which now sits at $1.8 million in capital), so they are protected.
- Work is ongoing to rationalize the rock collections and teaching collections in the department - we are overflowing with samples!

Department of Geology, University of Toronto

A number of planning activities are currently active in the Department of Geology. Several faculty appointments from other units in the Faculty of Arts and Science (FAS) at U. of T. will be moving to our department, starting July 2012. This comes about as an initiative from the Dean's office that offers members of physical geography and geophysics (from the Departments of Geography and Physics, respectively) the option of moving their appointments here with the idea of consolidating Earth sciences in FAS. Related to this, the Department is in the midst of discussions on the prospect of changing our name--the decision on a new name or to keep "Geology" will be resolved this academic year. Furthermore, across FAS we are restructuring our programs (and governing structures) related to the environment and resources. Decisions are still pending, but this may include for example an overarching School of the Environment to enhance teaching and research in these fields among member departments (e.g., Geology, Geography, Ecology and Evolutionary Biology, Physics, Chemistry).

Our faculty complement is down one from last year to 12.5 tenure stream research faculty on the St. George campus. This vacant position will be filled with the search commencing in September 2012 (precise field still to be determined). There are currently three faculty members at UTM and three at UTScarborough within the broader graduate Department of Geology at U. of T. There is a search underway for a new appointment in "geochemistry, geophysics, sedimentology or related fields" at UTM. In addition there are 8 cross appointed faculty to Geology from physics, engineering, geography and the Royal Ontario Museum.

Our undergraduate program enrolments for 2011-2012 are 127--approximately evenly distributed between our specialist, major, and minor programs. This represents a decrease of 11 students, but is more than triple the amount from 2005. These numbers don't include mining engineering students that take many of our core geology courses--e.g., in our bellwether second-year mineralogy course there are >60 students and we've had to add extra lab sections to accommodate the greater numbers. Our distribution/"service" teaching remains significant--approximately 1400 students in various first and second year courses. A significant challenge is finding the teaching resources for the undergraduate programs. We retain a nominal annual faculty teaching load of two undergraduate "half courses" (i.e., single term courses) plus a graduate half course and our teaching time is stretched trying to maintain the program t(e.g., given academic leaves, etc.).

Graduate enrolments are fairly steady at about 40 (~75% of which are Ph.D.; the others M.Sc. and M.A.Sc.). Domestic graduate students are guaranteed ~$25.5k in funding (more for scholarship students) and international students ~$35k. The RA component of support for grad students--the only component of student funding that supervisors are required to pay from these funding packages--remains at \$7500 for all graduate programs in the department.

Department of Earth and Environmental Sciences, University of Waterloo

This year has been busier than usual on a number of fronts. Both the undergraduate and graduate programs are due for review. A great deal of effort has been spent on assessing programs, compiling data, and planning. The good news is the data show steady increases in student numbers in our Earth Sciences UG programs, nearly doubling over the last four years. Grad student numbers remain constant; we expect numbers to increase once new faculty members arrive.

We have been busy recruiting new faculty. P. van Cappellan, our Canada Excellence Research Chair in Ecohydrology arrived in June. We have completed recruitment for a position in Geomicrobiology/Biogeochemistry and possibly another in ecohydrological modelling, both of whom expected to join us in 2012. Also, we expect to have our new appointments in Economic Geology and Solid Earth Sciences to join us in the new year.

Internationalization remains a priority for the Faculty of Science and the Department. We have agreements with 15 partner universities in China as part of our China 2+2 program. Currently, there are around 50 Chinese students in Earth Sciences.

The Earth Sciences Museum and the Rock Garden continue to expand. At long last through a retirement, we have managed to get a permanent staff position to coordinate outreach activities for the department and take over responsibility for the Museum.

Budgets continue to be a challenge. We expect a cut of 2-3% again this year. Cuts are especially difficult with pressures to maintain and increase enrolment numbers.

School of Geography & Earth Science, McMaster University, Hamilton

Faculty/staffing: The School of Geography & Earth Sciences (SGES) hired a cold region hydrology faculty member, Dr. Sean Carey, who joined School on July 1, 2011 as an associate professor. We are also in process of hiring a geology faculty member as an Endowed Chair in Earth Sciences. This position is being supported by a donation of $1 Million to School of Geography and Earth Sciences by Susan Cunningham, Research Chair in Geology, Senior Vice President, Exploration, Noble Energy Inc.

Dr. Luc Bernier and Dr. Mike Mercier have been offered Teaching Track Appointments as Assistant Professors effective July 1, 2011. Dr. Ulrich Riller has

now accepted a position of Tenure Track Appointment as professor in the School of Geography and Earth Sciences as of January 1, 2012.

Undergraduate matters:

The total number of students taught in SGES courses during the 2010-11 academic session was 11402, registering a 5% reduction from the previous year. Approximately 30% of the students were enrolled in service courses offered to the university community by SGES. 7930 of the students were registered in core, program courses and of these, 1398 students were registered in the three Level I Environmental/Earth Science courses (1A03, 1B03, 1G03).

In total we have 174 students registered in B.Sc. programs (Level II and above), an increase of 30 students from the previous year.

Graduate matters:

As of November 2011, SGES has total 69 full time (37 PhD, 20 MSc and 12 MA graduate students) and 13 part-time (8 PhD, 2 MSC and 3 MA students) graduate students. Approximately 50% of our graduate students are supported by external (NSERC, SSHRC, OGS) scholarships.

In 2011, School has introduced 7 core courses to streamline graduate course offerings as described below. In consultation with supervisor, the core course(s) will be mandatory for graduate students enrolled in that particular stream:

- Advanced Methods in Sedimentology and Stratigraphic Analysis
- Hard Rocks
- Advanced Hydrology
- Advanced Environmental Geochemistry
- Spatial Analysis
- Health Geographies
- Social Geographies

School also offered two new graduate courses:

- Advanced Structural Geology, ES758 (Dr. Riller, Fall 2010)
- Numerical Modelling in Global Climatology, (Dr. Baker, Winter 2011).

School hired a new teaching support technician (Alyson Brown) in August 2010.

Brock University, Department of Earth Sciences

We have a faculty complement of 10, and five staff positions. Two faculty are in administrative positions (Profs. Rick Cheel, interim Dean, Faculty of Math & Science and Greg Finn, Associate VP Academic) and another (Dr. Dale Hess) is an ILTA covering temporarily for one of these positions. We hope to obtain decanal approval to search for a tenure-track replacement for Prof. Finn, whose term extends to 2016, once the new Dean of our Faculty begins his term in January. We have had considerable success in finding placements for our summer co-op and graduating students in the resource sector (we note the fact that our students won three of the four prizes in MiHR's inaugural photo contest http://www.mihr.ca/en/news/Photo_Contest_Results_Nov2011.asp), despite not being able to hire an economic geologist since the passing of Prof. Simon Haynes a decade ago. We have managed to maintain a number of relevant courses in these areas, particularly through our most recent hires (Profs. M. Schmidt and M. Head), but economic geology is our most pressing need in the (hoped for) upcoming search. We anticipate losing another technical support position to retirement, but we hope to convince our Dean that at least one "new" technical position is essential to the running of our department, despite continued cutbacks at Brock. Departmental enrolments in undergraduate majors (in our Earth Science and Environmental Geoscience programs) remain around 85, and the healthy numbers have ignited an *esprit de corps* that had been dormant since the high enrolment days of the early 90s - expressed in the re-establishment of our *Geolympics* event in September 2011 after a decade in hiatus. We continue to teach nearly 1000 undergraduate students in first-year courses, with Earth Sciences remaining a very popular science context credit for students across the university. Graduate numbers have continued to decline (to eight in the past year) primarily due to the funding shortfall, despite the fact that eight of our 10 faculty members remain research active. Our faculty also remain active in service roles in the geosciences community, with Prof. Uwe Brand as Editor in Chief of *Chemical Geology*, Prof. Martin Head as Chair of the *Canadian Stratigraphy Commission*, and Prof. Greg Finn as President of *Geoscientists Canada*.

Environmental Science, University of Windsor

Our main change is that we have redesigned all of our undergraduate teaching such that it is now all under the banner of Environmental Science, including the geoscience component. Our enrolments have also increased noticeably this year, although I am not sure if the two things are related. At the grad level, we are still broad (Earth Sciences) and have considerable strength in resource geoscience as well as environmental geoscience. Iain M. Samson

Lakehead University Department of Geology

In 2011/2012, the department experienced the highest enrollment of majors in its history, a level that appears to be repeated in the current academic year. In the previous year, our graduate enrollment was also at a record level, although graduating students have not be replaced in the current year. The scarcity graduate student teaching assistants is creating difficulties in view of the large numbers of undergraduate students.

We have six faculty, with sessional help in only two courses. One faculty member is scheduled to retire at the end of the current term, and another at the end

of June, 2013. We have requested a replacement position, as well as a growth position in light of our student numbers as well as some plans for expansion into areas of mining and exploration geology. Stephen A. Kissin

Department of Geological Sciences, University of Manitoba

1. Personnel. We have been able to address retirement of two faculty members in 2010 through appointments associated with externally-funded programs. The Faculty of Environment, Earth, and Resources was awarded a CERC in Arctic Geomicrobiology and Climate Change. The CERC Chair, Dr. Søren Rysgaard, is appointed to Geological Sciences and one of the three new faculty members associated with the program, Dr. Zou Zou Kuzyk, will also join the department, in January 2012. She will have teaching responsibilities in the department, and will do research in biogeochemistry of Arctic continental margins. We will also welcome a Junior Chair in Watershed Systems Research, funded by the Province of Manitoba. Dr. Geneviève Ali will join the department in February 2012. Her research interests include catchment hydrology and hydrologic connectivity. The department was also able to appoint an existing sessional instructor to a one-year Instructor position. Among her duties, Ms. Karen Ferreria will teach a new course in Mineral Resource Development and develop a course in Mineral Exploration Techniques.

2. Student numbers. Undergraduate student numbers remain high. We are still close to our cap of two lab sessions per course, for courses involving microscopes, geophysical equipment etc.

3. NSERC. Disruptions associated with the Discovery Grant program continue, with the 2009-2010 competition resulting in one more faculty member no longer being funded, the second to lose their grant in two years, and a second faculty member being awarded only a one-year grant. We have an increasing number of applications each year: 7 of the 12 eligible faculty members this year. The decreasing number of faculty supported will have an impact on the department's graduate program, with an increase of the number of sub-disciplines (particularly in field-based areas) in which it will be difficult for the department to support graduate students.

4. Other events.

(a) The department and faculty have undergone significant disruption associated with construction of a new floor to house the CERC program. This has included dealing with a major water leak that required complete re-insulation and interior dry-walling of the whole north wall.

(b) The department has continued work on hosting the 2013 GAC-MAC meeting.

(c) The department is working with University College of the North on the delivery of first year courses at the Northern Manitoba Mining Academy.

Department of Geology, University of Regina

The Department trains Geology students at undergraduate (BSc & BSc Honours) and graduate (MSc & PhD) levels. Students completing our geology degree are eligible to apply for professional accreditation with the Association of Professional Engineers and Geoscientists of Saskatchewan (APEGS).

The Department of Geology has 7 faculty members, including 4 full professors, 2 associate professors, and one assistant professor. Our programs have been assisted by two fulltime Geology Lab Instructors and 7 adjunct professors.

Our student numbers continue to increase in 2011 with total of 144 Geology undergraduate majors, 18 Master students, and 4 PhD students. In addition, we hosted 1 PDF and 6 visiting scientists in 2011. The Department also offers a co-op and internship program for Geology majors.

The department supports 4 research labs: the "Geofluids Characterization and Modeling Laboratory", the "Geomodeling and GIS Laboratory", Organic Petrology Laboratory", and the "Scanning Electron Microscope Laboratory".

University of Saskatchewan

Undergraduate numbers are holding steady, in fact up marginally. I think we had 143 declared majors last year and there are 150 this year. Graduate student numbers are up by about fifteen percent.

Two proposals are being considered that will place increased pressure on our programs. After much lobbying from the mining industry, the university has decided to start a program in mining engineering. This will impact on us as there will certainly be some demand from this program for basic geology classes. Secondly, the College of Engineering has asked Geological Engineering to plan for a fifteen percent increase in enrollment in Geological Engineering (in addition to that from mining engineering). We cannot increase the size of our second year classes without major changes, so these two proposals probably mean fewer seats for geology majors.

We had some rather big donations to the department this year. Another is in the works and I should be able to tell everyone about it next year. I am hoping we are seeing the leading edge in the retirement of people who graduated into boom times.

The provincial government is currently looking at a business plan for a minerals research institute. They have proposed provincial funding and are awaiting matching funds from industry. I expect this will go ahead later this year as industry has lobbied for the mineral institute. It is not clear what its founding will mean for the department. Jim Merriam

Earth and Atmospheric Sciences, University of Alberta

Major Changes in last 2 years:

Retirements: Philippe Erdmer and Peter Kershaw

New Hires: Nick Harris (Unconventional Hydrocarbon Reservoirs, Hydrocarbon Geochemistry) from Colorado School of Mines

Graham Pearson (CERC Chair in Arctic Resources), from Durham U, UK

Long Li (Stable Isotope Geochemistry) - from U. Toronto (starts July 1 2012)

Open Positions EnCana Chair in Water Resources (cycle of water use related to industry operations)

CAIP (Provincial) Research Chair in Enhanced Geothermal Systems

Enrolments:

Graduate: 159 graduate students on the books

Undergraduate: Geology - rapid and continuing growth to the point that it challenges program delivery

Environmental Earth Sciences - steadily upwards

Infrastructure

50% of Faculty now housed in the new Centennial Centre for Interdisciplinary Science (which is physically connected to the Earth Science Building), with major new labs for Hydrochemistry, GIS/Remote Sensing, Quaternary Geoscience, Resource Geoscience and Structural Geology, Hydrogeology

New cleanroom suite opened in 2011.

New ICPMS facility under construction (related to CERC Chair)

Canadian Centre for Isotopic Microanalysis (CCIM; Cameca 1280 Ion Microprobe) opened 2010

New Electron Microprobe (Cameca), 2 new Zeiss EVO SEMs, Micro CT

University of Calgary Summary ~ November, 2011

The Department of Geoscience has 37 faculty members (including two active Emeriti Faculty Professors). Dr. Holger Steffen will hopefully be joining the Department in 2012 as a tier II CRC in "Arctic Basin Dynamics" (pending his successful application for funding).

Dr. David Eaton will be stepping down as Department Head on June 30, 2012; a search committee for a new Head will be established in January 2012. Dr. Eaton has done a formidable job as the Department's Head for the past five years; we wish him all the best as he returns to research and teaching as a Professor in the Department.

We had one official retirement in 2011 – Dr. Deborah Spratt. Dr. Spratt is recognized for outstanding contributions to sedimentary geology in Canada, commending major contributions to regional tectonics, petroleum and structural geology. Dr. Spratt has been training structural petroleum geologists for 30 years, during which she has supervised numerous geoscience students and professionals.

Enrolments continue to surge; there are an estimated 580 undergraduate majors this year; graduate students number approximately 220. There are about 4250 students registered in our service and first year courses.

In May and August 2011, the Department of Geoscience offered an unprecedented 16 sections of geology, hydrogeology and geophysics field schools, with a total of 255 students registered. In 2012, we predict that we will need to offer 17 sections to accommodate an estimated 300 students. Field schools continue to be a challenge to offer for various financial and logistical reasons. As such, the Department is pursuing the option of delivering some our field schools through the U of C's Group Studies Program, the main implication being an increase in cost to our students for services rendered by the GSP office staff.

For the past three years the Department has been engaged in a major program and curriculum review and re-design initiative. Our Geoscience Undergraduate and Curriculum Committee (GUCC) has been leading the way by hosting retreats and brainstorming sessions for faculty and students to learn about what's working in our curriculum and what's not. In April/May 2011, GUCC presented a new and improved Geology program to the Department; it was accepted. We are now working toward getting Faculty and provincial level approvals for this outcome-based program, which focuses on experiential and applied learning.

The new "Energy Environment and Experiential Learning" (EEEL) building opened (on time) in September to welcome hundreds of students into new teaching facilities in science and engineering, including a state-of-the-art core laboratory and a digital microscopy laboratory.

A new "splash wall" has been installed on the second floor of the Earth Science building. The five-paneled display describes what geoscience is all about, in addition to the research and educational opportunities available at the U of C.

The Department of Geoscience hosted another successful Open House and Research Symposium on October 21, 2011. This time the event was held on campus, allowing current students to explore the Department and ongoing research activities.

The Department of Earth Sciences, Mount Royal University, Calgary

We are proud to announce that our first group of Geology Major students will graduate in the Spring of 2012. Twelve students are expected to receive their undergraduate degrees with the annual number of graduates rising to between twenty and twenty-four in future years.

The department has expanded to six full-time geology positions, four full-time geography positions, around fourteen part-time faculty and three support

staff. Barbara McNicol will complete her term as Chair of the department in 2012 and Paul Johnston will take over leadership of the department for the next five years. Michelle DeWolfe recently received our first NSERC research award. Geology numbers remain sound with around sixty first year General Science students applying each year for the twenty-four Geology major positions. Two new, fully-equipped Geology labs opened in the Fall to relieve our space crisis and host advanced level courses. A Geography minor program has been added to our offerings.

Field Schools and Field Trips continued to be emphasised but transportation and funding issues are becoming an area of concern. A dedicated `Field Education Fund` is a priority for the future.

Earth and Environmental Sciences, UBC Okanagan

Research developments in EESc (Earth and Environmental Sciences) over 2011 centered on utilizing the $2,000,000 flagship UBC Okanagan FILTER laboratory (the FIpke Laboratory for Trace Element Research = FILTER) managed by EESc and donated by Charles Fipke. We anticipate that the first publications from the lab will occur in 2012 but it has already contributed to the training of over 20 undergraduate and graduate students who used it in their theses. Projects presently moving through the lab are analyzing gold, silicate minerals, glasses and carbonates for up to 50 trace elements. We are looking for collaborative projects (minimal analytical fees) that will help establish the facility. Capabilities of the lab expanded this year with arrival of a $650,000 TESCAN Scanning Electron Microscope with EDX mineral analytical capabilities. This latest donation from Dr. Fipke led to a government grant that added an EBSD detector for fabric analysis and hired a full-time technician. This instrumentation supports the LA ICP MS lab by providing internal standard data required for most LA ICP MS analyses. These donations reflect Dr. Fipke's goal to create the best micro-analytical geochemical laboratory in Canada.

Undergraduate enrolment approaches 90 students in 2nd, 3rd and 4th years, and we have over 20 students in graduate studies. There were ~24 graduates (undergraduate and graduate) in May 2011. These undergraduate and graduate numbers apparently make us one of the fastest-growing departments in Canada. With only 8 faculty, some with responsibilities in more than one department, we had an effective teaching force of only 5.5 people. Our enrolment successes drove the hiring of a new tenure-track professor that will expand and regularize (fewer courses offered in alternating years) course offerings, and take pressure off our over-worked faculty. As an aside, we had dozens of students with jobs last summer that brought in over $20,000.00. Some had jobs bringing in nearly $50,000.00 (4 months) and a few graduates from last year headed up exploration programs resulting in salaries of over $100,000.00 per year. This is unquestionably driving enrolment, but our department remains committed to long-term sustainability and so we will not diminish our commitment to the environmental side of the discipline.

UBC-Vancouver:

The Department of Earth and Ocean Sciences at UBC Vancouver has approximately 45 faculty, 60 postdocs and research associates, 200 graduate students, and 400 majors and honours undergraduate students. Undergraduate program enrolment and service course teaching are both up about 10% this year following on initiatives to increase enrolment in recognition of the new UBC budget model that more directly ties funding to deliverables. Graduate student enrolment is up about 20% and is distributed across many disciplines. There were no changes in faculty appointment this past year, but we are currently running searches for three faculty positions: a tenure-track instructor in Geological Engineering, a tenure-track assistant professor in oceanography or atmospheric science, and a Tier 2 CRC in geomicrobiology (split 50% with the Department of Microbiology and Immunology). Interviews are expected to run December through February.

Of our seven undergraduate programs, two (Geological Engineering and Environmental Sciences) are at capacity and are limiting intake. The other five programs (Atmospheric Science, Earth and Ocean Sciences, Geological Sciences, Geophysics, Oceanography) can accommodate growth. Re-introduction of disciplinary majors programs in geophysics and oceanography have led to increase enrolment, and the reinstatement of the majors geology program currently under awaiting approval is expected to yield similar changes. We continue to increase our service teaching through a combination of face-to-face courses and distance education.

We are in the midst of a substantial facilities renewal. In September we opened a new CFI-funded $7.5 Million expansion of the Pacific Centre for Isotopic and Geochemical Research, including an interface with the Pacific Museum of the Earth. The new Earth Sciences Building ($75 Mill) funded as a partnership by the mining industry and the Province, will be ready for occupation in August 2012. About one year of renovations to our existing buildings will continue through 2013 at which point the teaching, research, and administrative functions of the department will have been completely reorganized for the first time in the 16 year history of the department. We launched a $2.4 Mill fund-raising campaign last month to rebuild our field school facility in the southern Okanagan and have been very satisfied with donor responses to date. If fund-raising continues on track, we expect that the new facility will be built in 2012-13 in time for use in the spring 2013 field season.

School or Earth & Ocean Sciences, University of Victoria

Enrolment: At the end of the last academic year (spring 2011), our total undergraduate enrolment was 1810 students. Our final undergraduate enrolment figures for 2009/10 was 1672 students. The increase in enrolment over the past year is attributed to increased enrolment in EOS 170 (Natural Hazards, up to 227 from 193 last year) as well as increased numbers in our second and fourth year courses- Our graduate enrollment for 2010/11 is 80.67 students (please don't ask …) up slightly from 77 last year. A significant number of our graduate students are slated to graduate in the near future, and so we are expecting these numbers to drop over the coming year (by at least 0.67). Enrolment is up by at least the same amount again this year.

Program / Course changes

No significant program or curriculum changes came into effect in 2010/11. Our fourth year field school, which usually consists of a transect of the Cordillera, is being taught in Cyprus this year, and will consist of a transect of the Troodos ophiolite. 2010/11 was the last year during which our introductory courses EOS 110 (Oceans and Atmospheres) and EOS 120 (The Dynamic Earth) were taught together with the Department of Geography. Geography now teach its own introductory courses, as do we. The divorce was initiated by Geography and SEOS was given no say in the matter. Due to the changes in the Geography program, our joint SEOS-Geography students no longer have to take 2nd year Geomorphology as part of their degree.

Faculty / Staff

Our marine technician (Ian Beveridge) departed for a position at Dalhousie University. This presents us with a significant challenge. Many of our faculties research programs are based on ocean-going expeditions, and a number of our undergraduate courses involve marine field work. We are currently trying to fill the position. Budget cuts instituted by the university (2% last year; 2.5% this year, and planning on at least 2% next year) are hitting hard. Seven staff are in the process of being laid off across the Faculty of Science. We will be losing one of our three technical staff positions.

A new Assistant Professor, Dr. Colin Goldblatt, joined our department in September. Colin was a research associate in Astronomy department at the University of Washington. His research focus is on the coupled evolution of climate, geochemistry and life on the early Earth.

Dr. Eric Kunze, a Tier I CRC in Physical Oceanography who was jointly appointed to SEOS and the Department of Physics, left this year, returning to a position in the US. Eric's decision to depart came after not having his Tier I CRC renewed. We subsequently lost the position; the CRC was split into two Tier II positions that were distributed to other departments in the Faculty of Science.

Dr. Kathy Gillis, director of SEOS for the past 7 years, moved on to accept a position as the Associate Dean of Science. The vacated position of Director of SEOS was filled by an internal candidate. Only one person let their name stand for the position of Director, despite my concerted efforts to nominate everyone else in the department.

Dr. Kim Juniper, joint appointment in SEOS and Biology, and who holds a BC Leadership Chair in Ocean Ecosystems and Global Change, was seconded to NEPTUNE Canada (the cabled seafloor observatory located west of Vancouver Island) as their Associate Director (Science). In return, NEPTUNE has agreed to provide us with funding to hire a limited term (3 to 5 years) Assistant or Associate professor. We are currently in the process of determining how best to utilize this position and plan to advertise before the end of the year with the goal of having this person in place for Sept. 2012. We will be hiring a geologist. We previously agreed to the secondment of Dr. Verena Tunnicliffe to VENUS (another marine cabled observatory located in Saanich Inlet and the Salish Sea).

Another of our professors (an aqueous geochemist) has just submitted his resignation and will be leaving at the end of this year.

Issues / Challenges

It is not clear to me how we will administer additional budget cuts that are almost certain to be imposed in the coming year. We are now reduced to two part-time technical staff to run all of our labs and to run and maintain all our equipment. Our office staff consists of two full time and two part time employees. In addition, we have three senior instructors.

We are in the process of undertaking an External Academic Review. The Review panel will be visiting our department in March 2012, and will consist of Dr. Fred Longstaffe (geochemist - Western), Mark Abbott (biological oceanography - Oregon State), and Geri van Gyn (internal UVic member).

Many of our second through fourth year classes are now filled to capacity. Class size limits are dictated by lab facilities and by teaching support (TA positions and Senior instructors). Our third year field school (EOS 300) is, for the second year in a row, oversubscribed. Registration is capped at 39 students and is taught by one professor and two senior instructors. We are also finding that we are receiving increasing numbers of applications for EOS 300 from students enrolled in other universities (including a significant number from the University of Saskatoon). We capped our fourth year field school at 23 students and it too is oversubscribed. The course is taught by one professor and one senior instructor. 27 students applied for the 23 available positions for this year's field school.

As that the university has in essence put in place an unofficial hiring ban we may be hard pressed to keep any positions lost through retirement or resignations.

Memorial University of Newfoundland Department of Earth Sciences

Undergraduate Students

The number of undergraduate students (2nd to 4th year) majoring in Earth Sciences over the last 15 years (counted in fall semester) is shown below. The number of students has grown overall from a low in 2005. The significance of year-to-year variations is hard to judge, but this is the second year in a row that we have suffered a decrease in the number of majors.

The number of Registrations is the total registration in all our courses and reflects service offerings as well as "core" courses. Explaining such variations is difficult and, when questioned by middle ranking administrators (with limited statistical knowledge), can be a stimulus to creativity.

Graduate Students

The number of graduate students remains high compared with three years ago and continues a relatively steady improvement over the situation in the late 1990's when the poor state of the Provincial economy challenged both University funding and leadership.

Faculty Interests and Research and Teaching

We have 30 current faculty members ([including 4 emeritus], one Honorary Research and two University Research Professors), 2 CRC Chairs, 2 Tier II. We suffered one retirement (Dr Mark Wilson) in September 2011 and one resignation (Dr Sam Bentley) in January 2011.

Dr Steve Piercey was awarded an NSERC IRC.

There are opportunities for two new chairs supported (at least initially) by industrial sponsors and these are being actively pursued. A replacement for Dr Sam Bentley is being sought but it is not assured that an appointment will be made in Earth Sciences.

The problems with start up funds for new faculty reported last year may have been alleviated. The Faculty of Science will now provide start-up funds, subject to the condition that the new appointee apply to the Research and Development Corporation of Newfoundland & Labrador. If the RDC application is successful, the Faculty of Science then recovers the funding, thus enabling it to provide more money overall.

Faculty in the Department received approximately $950k from RDC and $900k from NALCOR PEEP in the spring.

New field schools (Environmental & Geophysics) were run in the Baie Vert area this spring by relatively newly appointed Faculty (Drs Farquharson, Morrill and Cheng) and were very successful.

Institutional support for infrastructure

The steady re-equipment of the undergraduate teaching laboratories continues. We are also attempting to upgrade our lapidary facilities after a period of stasis.

Challenges

Research output is linked to graduate enrollment, which is, in turn tied to University support as well as external funding. The desire of the University to become more visible in research needs to be supported by the allocation of resources to support graduate student research. As was noted last year, it appears that in future more of the burden of supporting graduate students is likely to carried by the Departmental budget.

The Enterprise Risk Management arm of the University continues to propose unworkable policies for the management of Off-Campus Risk, a category into which our field schools fall. If these policies were implemented, our ability to offer such courses would be compromised, with corresponding effect on eligibility for professional registration of our graduates.

As noted above, balancing the desire of the University to have prestigious, externally funded chairs with the needs of the undergraduate curriculum and of professional registration remains a challenge. Such appointments, though welcome, often carry reduced teaching and, if filled by mortgaging future retirements, can compromise the teaching program unless carefully managed. The Department is currently renewing its strategic plan for the next five years and this issue will be addressed therein.

There is a proposal to create a new building to house the whole of the Faculty of Science. This may be an opportunity but, given that we are housed in a well-found building that is less than 25 years old, carries the risk that our space and infrastructure may be reduced in quantity and quality.