ACADEMIC PROGRAMME REVIEW - SELF STUDY

DEPARTMENT OF GEOGRAPHY

MEMORIAL UNIVERSITY

September 2011

1. Introduction

Introduction

The Geography Department's first Academic Programme Review (APR) was in 2001. The most significant change in decade since our first APR has been the shape and structure of our faculty complement. Since 2001 we have hired nine new faculty members largely through the replacement of retired faculty members. Our new appointments represent a new generation of younger faculty who are both research active and outstanding teachers. This process of renewing our faculty complement has had a significant impact on our research activity, on the growth of our graduate programme, and on the structure of our teaching programme.

The purpose of an Academic Programme Review is: "to evaluate the quality, success, and role of academic units and programmes in the fulfillment of their own and the University's mission and strategic goals; to encourage academic planning, innovation and improvement in units and programs; to provide an occasion for units and programmes to identify opportunities and find ways to pursue them; and to avail of fresh perspectives from colleagues outside Memorial" (Procedures for the Review of Units and Programs, 2010).

The policy at Memorial is that APRs should be formative: "That is, it is an opportunity for the unit or programme to work collegially to find ways of improving upon what it does"(Procedures for the Review of Units and Programs, 2010). As a Department we take this opportunity seriously and we look forward to discussing and responding to the recommendations of the APR review committee.

In this introductory section of our self-study report, we provide a brief overview of the faculty complement in Geography and our administrative support. We discuss our access to space and our use of this space. Finally, we outline the methodology and the structure of the rest of this self-study document.

Geography faculty

There are currently 15 faculty members in Geography with one new appointment arriving in January 2012, which will bring our total complement to 16.[1] While we are a relatively large Department in the Faculty of Arts, our faculty complement is considerably less than we had during the early 1990s when our complement was between 18 and 19. The period between 1990 and the early 2000s was marked by fiscal austerity at Memorial. The result was that retirements in Geography during this period were not replaced with new appointments. Our faculty complement declined to between 15 and 16. At the same time, our faculty became more senior: there were no assistant professors in the Department in the 2000/1 academic year.

Since 2001 Memorial University as a whole, and the Faculty of Arts in particular, has focused on faculty renewal. The Geography Department has benefited from this change in policy. In Geography we have made 9 new appointments, mainly by replacing retired faculty. The result is that we are relatively speaking a much younger department than we were before, with 3 full professors, 10 associate professors and 3 assistant professors. Five of our faculty members are currently in

[1] One of our appointments, Evan Edinger, is a joint appointment with Biology (60 percent Geography, 40 percent Biology).

tenure track positions. We make the case in the research section of the self-study for *three additional faculty positions* (over and above retirements), which will bring our total complement to 19. Our case is based on the impact that faculty renewal has had on the Department since the last APR.

In terms of disciplinary breakdown the Department has a relatively larger complement of faculty in the human geography/natural resources division than in physical geography. The GISciences complement is at three, which is sufficient to allow us to offer a full programme in this field, including the Diploma in GIS. In terms of our hiring decisions moving forward we will look towards establishing a more even balance between human geography/natural resources and physical geography.

The renewal of the faculty complement in Geography has paid enormous dividends for us as a Department and for the University as a whole. We have demonstrated the value in 'investing' in a unit that has a strong culture of teaching and an outstanding track record in research. This is one of the key messages we present in this self-study and it is the basis on which we are requesting three new faculty appointments, which will bring our complement back to where it was in the early 1990s.

Administrative support

The Department has 5 support staff: one administrative staff specialist, one intermediate secretary, one cartographer, one GIS and computer support scientist and a science technician. We are facing change in the near future with regard to our administrative support with Harriett Taylor (admin staff specialist) retiring and Carole Anne Coffey (intermediate secretary) taking long-term disability. We have found an excellent temporary replacement for Carole Anne Coffey, but this is not a long term solution and we are anxious to fill this position permanently given the important the intermediate secretary plays in assisting undergraduate and graduate students. The Department is also anxious that we find a suitable replacement for Harriett Taylor given the crucial role she plays in managing our research and graduate student budgets. As we outline in the research chapter below, the growth in our research funding and graduate student cohort has meant that the demands of this position have increased dramatically. It is crucial that we are able to replace Mrs Taylor with the best administrative talent available.

Space

There is no question that space is one of the most important challenges facing Memorial University. It is affecting the University's ability to offer adequate research and teaching space, and space for graduate students. In other words, the problem of space is compromising the University's ability to achieve its key strategic goals.

We have used the limited space we have optimally. Our laboratory spaces on the ground floor of the Science Building are heavily used by faculty, researchers and by graduate students. They are central to our research activities in physical geography and GISciences. On the second floor of the Science Building we have a GISciences lab that is heavily utilised. On the second floor we have had to reassign a teaching/meeting space to laboratory space for a recent appointment in physical geography (Joel Finnis). And we have access to shared space in the prefabricated building occupied by the Computer Purchasing Centre. It is crucial to note that the laboratory spaces we occupy have been upgraded through external grants (Canadian Fund for Innovation, NSERC etc). In all of our laboratories we have taken spaces that are in an extremely poor state of repair and upgraded them to

state of the art research and graduate teaching spaces. However, we have now reached the limit in terms of what we can do with the space allocated to us. Given our track record in securing research funds it is vital that the University administration responds positively and actively to our requests for space.

Our graduate students have shared space on the second floor of the Science Building and we have access to several small offices on the ground floor, mainly for PhD students. With the growth of our graduate programme – which we outline later in the report – we face severe challenges in providing adequate space for our students.

The Geography Department has had significant success in securing funds to upgrade our teaching spaces. In each of the last 4 years we have applied for, and have been awarded, funds from the University's Classroom Teaching Infrastructure Development Fund (CTIDF). We have upgraded all of our classrooms and have established an outstanding seminar room that is now heavily used by other units and Departments (Summers Room). Our most recent CTIDF grant is allowing us to upgrade our GISciences teaching space, which will now include a smart board. We have, however, reached a limit in terms of upgrading our teaching space and we urgently require larger and/or more flexible teaching venues that can accommodate diverse teaching approaches.

We have shown our ability to upgrade our teaching and research space, either through external funds or through university administered funds. And we clearly have urgent space requirements given the growth of our graduate student cohort, the increase in research funding, the proposed increase in our faculty complement, and new incoming post-doctoral fellows. Given our strong and consistent contribution to the University's strategic goals, especially in research and teaching, it is crucial that we are given priority when it comes to the allocation of this important resource.

Methods, approach and structure

We have structured our self-study report using Memorial's Academic Planning Review document. The next section of our self-study focuses on our *strategic goals* through a discussion of our strategic planning processes over the last seven years. Section 3 of the self-study is a chapter on *teaching and learning*. In this chapter we describe our teaching programme and we outline innovations and new developments in our curricula. The fourth section of the self-study is on *research*. We provide data on our research income and awards. Through a description of our research projects we demonstrate the impact of research, the recognition we gain from our research activities, how we engage with community and other partners through research activities. We also describe efforts towards integrating research and teaching. The final chapter of the self-study is the conclusion where we bring together key themes.

We used the annual reports from the Centre for Institutional Analysis and Planning (CIAP) for the quantitative data discussed in the report. These data were complemented with information we extracted directly from 'Banner', Memorial University's data management system. The collection of other data for the report was generated through Departmental and committee meetings. Our strategic goals were developed through day long or afternoon long planning sessions that started in 2003. We held additional planning sessions in 2007 and 2009. The *specific goals* that have emerged in response to the current APR process emerged from a Department planning session in February 2011. A Curriculum and Planning (C&P) committee meeting was organised on the 16th of February 2011 to

generate discussion and provide input to the self-study on curriculum and teaching. Members of the C&P committee provided written input that was integrated directly into this self-study. Faculty members that were not members of our Curriculum and Planning Committee were also asked to provide written input for the section on teaching and learning. Our research committee met on the 24th and 31st of January 2011 to discuss the APR. Faculty members provided additional written input on their various research projects that were used to write the research chapter.

The report was completed in July 2011 and was distributed to faculty and staff in Geography for their comment and input. The comments and inputs were received and integrated into the final copy that was delivered to CIAP in September 2011 for distribution to the APR review committee.

2. STRATEGIC OBJECTIVES

Since our last Academic Programme Review (APR) in 2001, the Geography Department has made significant progress in identifying and working towards strategic objectives. This energy was partly a consequence of the 2001 Review Committee's recommendation on strategic planning: they recommended that future reviews '*include a document that specifically addresses the unit's long term plan and future direction*' (Appendix 1). Our 2001 APR submission did include what we called 'strategic objectives', where we identified specific goals in the three key areas of teaching, research and administration. In retrospect, however, it is seems that our goals in the three areas were too numerous and too narrowly focused. The Review Committee was looking, instead, for high level strategic objectives, under which one might expect to find strategic goals. We have spent considerable effort in responding to this concern.

Our efforts in strategic planning started in the 2002/3 academic year. The Department established a Strategic Planning Committee (SPC) consisting of 5 senior faculty members. The SPC met frequently during the teaching term (as often as once a week) to discuss and write a strategic planning document for Geography. The result of this considerable effort was presented to the Department in 2003 – 'Departmental Strategic Planning Principles'. The document included a new mission statement, a set of values that guide actions and decisions, and a vision (Appendix 2). In addition to this, it identified three key strategic issues that the Department would need to address: undergraduate enrolment levels, the image of the Department, and research activity. The problem with undergraduate enrolment was declining registrations and we were concerned that this would not allow us to replace faculty, which would in turn affect our ability to offer a broad and rich academic programme. The problem with our image was identified as a consequence of our location in the Faculty of Arts, but with a considerable presence in Science through teaching and research. Our objective was to increase our profile in both faculties. Finally, we expressed the concern that the Department was not seen as a strong research unit. The Department approved this document, with minor modifications, in April 2003.

The next phase of strategic planning started in 2007 under Keith Storey's headship. Rather than establish a set of strategic goals through a small Departmental Committee, the decision was made to involve all faculty from the outset. The first meeting was held in September 2007 and was facilitated by the director of Memorial's Harris Centre, Rob Greenwood. During this meeting the Department discussed progress towards the previously agreed strategic goals. The Department also discussed in open forum new or existing strengths, weaknesses, opportunities and threats (i.e. a swot analysis). The outcome of this meeting was 12 priorities that included, amongst others, the image of the Department, climatology teaching, priorities in terms of faculty renewal, the first year course and a course-based MA/MSc programme. Individual faculty members were assigned responsibility for taking forward specific priorities.

The last phase of strategic planning during this APR period started in 2009 with the appointment of a new head, Charles Mather. In September 2009 a strategic planning session was arranged, partly to complete the process that was started in 2007 by Keith Storey. The plan was to develop higher level strategic goals as well as a vision for the Department. Although this was an extremely productive and useful session in that we were able to generate new strengths, weaknesses, opportunities and threats in the context of changes at Memorial and new developments in the Department, we were not

entirely satisfied with the outcome. The feeling was that although we had laid the foundation for a discussion of strategic goals, we needed more time to make the final step.

We achieved this final step in February 2011. The work that had previously been put into strategic planning in 2007 and 2009 was evident in this meeting. We were quickly able to identify four high level strategic goals. These strategic objectives reflect our commitment to our students, to the Faculty of Arts and to the broader University community. They also reflect our goal of contributing to the province through teaching, research and service. Finally, our strategic objectives intersect closely with the strategic goals of Memorial articulated through the 2007 Strategic Plan and what has emerged through the more recent Teaching and Research Strategic plans for Memorial University.

Strategic Goal 1: Foster a thriving learning community

Fostering a thriving learning community is about maintaining and growing the current faculty complement, it is about encouraging collegiality in research and teaching, and it is about providing an environment that allows innovation and growth. This goal is of specific importance to the Geography Department given the rapid changes in the faculty complement since the early 2000s. We replaced 9 new faculty members between the last Academic Programme Review and the current one. In many ways, this younger generation of researchers and teachers will be responsible for taking the Department forward into the next APR process. By providing a thriving learning community we will ensure that this new generation is in a position to maintain a tradition of excellence in teaching, research and service.

Strategic Goal 2: Sustaining and enhance our provincial, national and international reputation

Our scholarship, our research networks and our efforts in knowledge mobilization are geared towards sustaining our provincial, national and international reputation. We are justifiably proud of our scholarly contributions to applied research in the province and within Canada and of our contributions to the discipline through research publications, conference presentations and through work on editorial boards of journals. We are also noted for our ability to establish and maintain research networks with government, non-government and the private sector in ways that enhances the reputation of our scholars and our discipline. This goal is to ensure that we sustain, build and enhance our reputation as scholars locally, nationally and internationally.

Strategic Goal 3: Continual curriculum innovation

Continual curriculum innovation is a goal that recognises our *ongoing* commitment to improving our programme structure, our course offerings, and our approaches to teaching. This means that we do not see curriculum reform and teaching innovation as something that happens in cycles or in response to a crisis (e.g. falling student numbers). Instead, curriculum innovation is a constant concern of faculty in the Geography Department for both undergraduate and graduate teaching.

Strategic Goal 4: Articulate the role and place of Geography

One of the challenges we face within the university and within our community is articulating the role and place of Geography as a discipline. This goal recognises the importance we place in articulating the role of Geography as an applied and theoretical discipline that is relevant to understanding and responding to contemporary challenges in our dynamically changing world. We will achieve this goal through a wide range of activities (including our new newsletters, Appendix 3) and at a range of

different scales, from local interactions with faculty and students at Memorial to our activities within the community and beyond.

Our strategic goals are closely aligned with the strategic goals of the university. Memorial's 2007 Strategic Plan identified 5 high level priorities: students, research and scholarship, needs of the province, conditions for success and institutional responsibility. Our four strategic goals contribute in significant ways to the priorities relating to students, research and scholarship, the needs of the province, and conditions for success. Our strategic objective of *continual curriculum innovation* is consistent with the Plan's targets for reviewing and updating teaching programmes, improving the student experience and the development of new programmes in strategic areas. This goal is also consistent with the newly released Comprehensive Framework for Teaching and Learning at Memorial University (2011). The Department's goal of sustaining and enhancing its *provincial, national and international reputation* provides a strong role for the Department in contributing to the 2007 Strategic Plan's goals of meeting the needs of the province. We are achieving this by contributing to the specific targets of transferring knowledge to the province, supporting and identifying the resolution of provincial challenges, fostering regional and rural development, and strengthening the impact of our research. Finally, we contribute to the Plan's conditions for success through our goal of *fostering a thriving learning community*. A key condition for success in the University's Strategic Plan is to ensure a vibrant and supportive working environment.

In concluding this section of our APR self study, we want to make three additional points about our strategic goals. First, the process of strategic thinking has been embedded as a 'normal process' in the Department. In a context of rapid change and new opportunities, it is crucial that we continue to see strategic thinking as continuous process rather than as something that we need to do in response to programme review. Approaching strategic planning in this way has also made us better at thinking strategically.

The second point is that the strategic goals we have identified reflect continuity in what we consider to be important. We are, for instance, still concerned with our place in the university and how we articulate the role and place of Geography in the university and beyond. Our efforts associated with the 50th Anniversary of the Department has provided one way of addressing this concern, but we will need to continually work on this strategic goal. This leads to the third and final comment: a reflection on our strategic planning process over the last decade has allowed us to reflect on the remarkable achievements we have made in the last decade. Our 2002/3 strategic planning process, for example, noted that as a Department 'we are not collectively seen as a strong research unit'. With a very high proportion of the Faculty of Arts' research funding and an extraordinary growth in graduate student registrations and completions, we are now recognised as a research intensive unit within the Faculty of Arts and beyond.

The next phase in our planning process will be about the structures and systems that need to be put in place to make these goals happen; and second, how we assess our progress towards these goals.

3. Teaching and learning

Introduction

The Geography Department is committed to excellence in teaching and learning. Three current faculty members are past recipients of the President's Award for Distinguished Teaching (Karyn Butler, Norm Catto and Chris Sharpe). One faculty member was also recently awarded the Canadian Association of Geographers Teaching Award (Norm Catto). Further evidence of our commitment to teaching excellence is that as a Department we agreed that *curriculum innovation* should be one our four strategic objectives.

Our appointment process for new faculty reflects our commitment to teaching and learning. The selection process requires that shortlisted candidates teach a lecture in a real class environment. Students in the class, and faculty who are present during the lecture, provide the search committee with feedback on the quality of the candidate's teaching. This is not a common practice within the Faculty of Arts or other units at Memorial. However, we consider this a crucial part of the interview process and candidates who take this part of the appointment process lightly, do so at their peril. The significance that we place on teaching in the appointment process means that we have hired academics who are committed teachers.

Our commitment to teaching and learning is widely recognised at Memorial. Several of our faculty have been appointed to key positions in a University wide planning process on teaching. The new plan, which was launched last year, aims to mirror the strategic plan that has been developed for research. The faculty members that will be playing important roles in this plan include Karyn Butler ('Critical Thinking'), Norm Catto and Ratana Chuenpagdee ('Complementarity with the MUN Research Plan').

In this section of our self-study we begin by providing a description of our undergraduate and graduate teaching programme and we discuss enrolment trends. We then present the results of a survey of undergraduate and graduate students conducted in 2008. We end this part of the self-study by discussing curriculum innovations that have been introduced as well as new initiatives that are in the pipeline.

Undergraduate teaching programme

Students who declare a major in Geography are required to complete 45 credit hours in the discipline (most courses are 3 credit hours). The programme is structured as follows: students complete a common first year course (Geography 1050), which in recent years has included sections on map work and GIS, population geography, climate change, and political geography. The purpose of the course is to provide a broad introduction to selected components of the discipline with a view to preparing them for courses in the second and subsequent years. This common introductory course was introduced in the 2003/4 academic year in response to recommendations from the 2001 Academic Programme Review. We provide a more detailed discussion of this change later in this section.

At the second year level Geography Majors are required to complete 6 courses. Five of these courses are three credit hours: 2001 Cultural Geography; 2102 Physical Geography; 2195 Introduction to Geographic Information Sciences; 2302 Economic Geography; 2425 Natural Resources. These

courses are offered in both the Fall and Winter semesters. The sixth second year level course is 2226 Field Methods I, a single credit hour course that students normally complete during the first week of the Fall Semester. The purpose of having a suite of compulsory second year courses is that it provides a stronger foundation for students in the discipline. Geography Majors are required to complete two additional third year courses: 3226 Field Methods II, which is a two credit hour course that follows on from the second year field course, and 3222 Research Design and Quantitative Methods in Geography.

The aim of Geography 3222 is to get students thinking about quantitative research design with particular emphasis on issues relating to data and the assumptions that underlie the 'tools' that they are introduced to in the course. The course includes several on the history of statistics as a discipline so that students know that it was 'invented', when and why it was invented, and especially (in terms of correlation and regression) its roots in the 19th century eugenics movement. The course begins with a module on Exploratory Data Analysis - with the hope that students will take this away with them for future use in other courses - understanding how important it is to kick around any data they are using before embarking on some kind of analysis that might assume the data has characteristics that it doesn't. Students are required to undertake a simple research project where they are responsible for defining the research question, finding and evaluating the data, and then analyzing it in an appropriate manner, whether this requires the use of either parametric or non-parametric tests or not. Some students complain about this, because they have so much trouble coming up with an appropriate research question or problem. Or finding appropriate data. But most students eventually see the benefits of the assignment.

Once students have completed these required courses, they have more choice at the third and fourth year level, which allows them to specialise in a particular area of the discipline. In order to qualify for the Major students must complete three third year courses and three fourth year courses, and one additional third or fourth year course. Our courses at the third year and fourth year allow students to follow sub-disciplinary fields including: GISciences, Economic Geography, Cultural/Historical/Political Geography, Natural Resources and Physical Geography (Figure 3.1). Although these fields are not formalised as 'streams', in practice we advise Majors on course selections that complement their interests and their career aspirations.

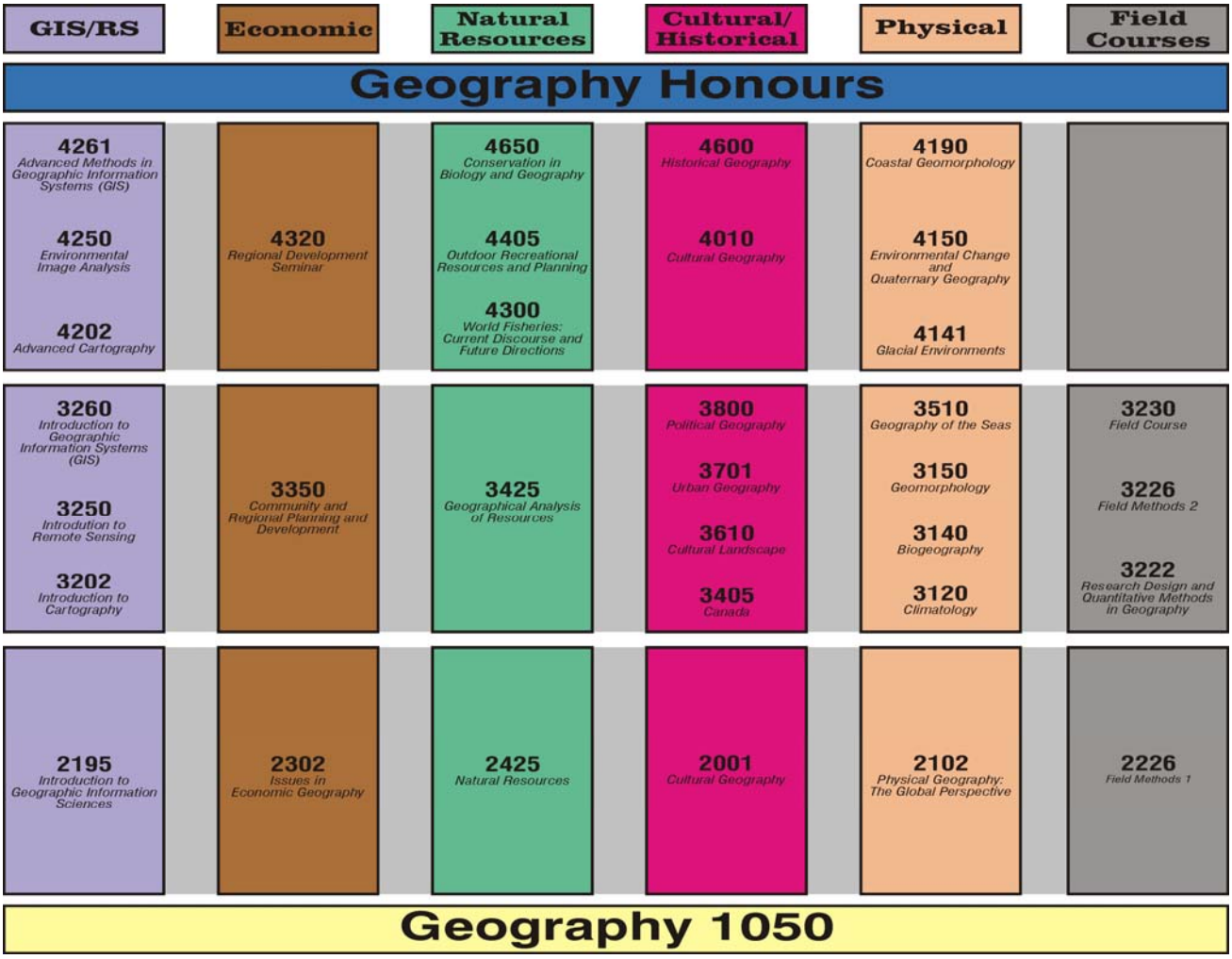

Figure 3.1: Teaching streams

Our Economic Geography course offerings provide an example of how our courses are scaffolded. The stream for students interested in economic and development geography begins with Geography 1050 as a foundation. A prerequisite for more advanced courses, Geography 1050 introduces core concepts of space, place and scale as well as relevant topics covered in greater depth in later courses, including trade agreements, demographic change and adaptation to climate change. Students moving on to Geography 2302 are then introduced to economic processes occurring multiple interacting scales, with a particular focus on global shifts and on broader theoretical perspectives and concepts such as globalization and sustainable development, the role of the state in development, and theories in economics and economic geography. The third year Geography 3350 Community and Regional Planning and Development course moves from a global to a more local/regional and national (Canadian) focus, basics of theory and practice, heavy reliance on case studies, and also project-based learning that allows for more intensive investigation of how course concepts apply in a particular region. The economic geography stream ends with Geography 4320 Regional Development, which is a course that examines the region in a globalising world. Case studies are drawn from all over the world. The seminar format of the course allows students to participate in a meaningful way in debates in regional development and economic geography.

Geography Majors are well positioned to take several complimentary programmes. Our GIS Diploma was introduced in 2002. In addition, students who have focused on Economic Geography are well placed to complete the Certificate in Regional Policy and Development introduced in 2010. We discuss both of these initiatives in more detail below.

Graduate Teaching Programme

Students admitted to our Graduate Programme are normally required to take two compulsory courses, Development of Geographical Thought and Practice 1 and 2. The first of these courses is an introduction to theories and ideas in Geography while the second emphasizes methods and techniques in Geography. We see considerable advantage in having our students doing common courses even though they come from different backgrounds in physical and human geography, and GISciences. By working together in these classes, students develop a sense of community, which is important to the overall success of our graduate programme.

Masters students are required to complete 2 additional courses while PhD students are normally required to complete one additional course beyond the two compulsory courses. One of the challenges we face given recent increases in graduate student numbers is how to build a programme beyond the two compulsory courses. Our most recent efforts have focused on offering a limited number of graduate courses in the key sub disciplinary areas (GISciences, human geography, physical geography, natural resources). Ongoing discussion with several cohorts of graduate students suggests that there is a demand for additional courses, but this is a demand that is difficult to meet with the current faculty complement. A larger faculty complement, which is one of the key outcomes we hope to achieve through this APR, will allow us to increase our graduate student cohort, while at the same time providing us with the resources to offer a more comprehensive graduate teaching programme.

Enrollment trends

Enrollment trends for the first year and senior **undergraduate** years are presented in Table 3.1. Our first year numbers showed a decline from 2002/3 through to 2009/10. The most recent figures show a rebound and we are now closer to the registrations we had in the 2007/8 academic year. Our senior undergraduate registrations (including laboratories) showed a rapid increase from 2002/3 and have declined although somewhat less than might be expected given the decline in our first year registrations. We reflect in more detail below on what might explain these trends. The number of course sections offered in the first year has varied between 9 and 6. In 2010/11 we made the decision to offer only 6 sections due to lower registrations in first year (four in the Fall and 2 in the Winter). We have offered between 41 and 46 course sections in an academic year. The number of courses offered ensures that we can meet the demand for students in physical and human Geography and GISciences.

Academic year	First year	Course sections	Senior undergraduate	Course sections
2002-3	897	7	647	43
2003-4	827	9	1231	43
2004-5	845	8	1568	45
2005-6	735	7	1640	34
2006-7	682	8	1536	47
2007-8	619	7	1498	44
2008-9	509	7	1342	41
2009-10	491	7	1130	46
2010-11	571	6	*	46

Table 3.1: Registrations in Geography courses 2002/3 to 2010/11

* Data not yet available through CIAP

Undergraduate majors in Geography	
Year	**Number of students**
2002	94
2003	119
2004	126
2005	145
2006	147
2007	141
2008	126
2009	103
2010	122

Table 3.2: Geography Majors 2002-2010

The number of undergraduate Majors in Geography has mirrored this trend in undergraduate numbers of a decline in during the 2000s with a more recent rebound (Table 3.2). It is also important to note that these figures underestimate the number of Geography Majors. We know from tracking students through their programme that many suspend their registration for a year or longer, only to return later to complete their degrees. Students that are declared Majors, but who do not register during an academic year, are not counted in these figures. To illustrate: in 2010 there were an additional 19 declared majors who did not register in the Fall of 2010. Our experience is that a reasonably high proportion will eventually complete their degrees. The number of degrees awarded has ranged from 24 to a high of 43 in 2007 (Table 3.3). We were unable to secure the figures for the 2010 degrees awarded but we expect to see a rebound as has occurred in the broad pattern of registrations. The number of Majors in the Geography programme is in line with similar sized departments in other universities in Canada (Canadian Association of Geographers, 2010).

Undergraduate degrees awarded	
2002	32
2003	24
2004	24
2005	29
2006	36
2007	43
2008	29
2009	27

Table 3.3: Undergraduate degrees awarded 2002-2009

The decline in our first year registrations is a consequence of changes in the demographic profile of the province. Our registration figures for first year mirror those for the Faculty of Arts, and for the University as a whole. Overall registrations for first year students in the Faculty dropped significantly in 2006/7 and 2007/8 with a slight rebound in 2008/9. Lower registrations have been a problem at Memorial since the mid-1990s, largely as a result of changing demographic patterns in Newfoundland and Labrador. Fertility rates in Canada stabilized from the late 1970s and 1980s, a pattern that was in line with other industrialized countries. The rates in Newfoundland and Labrador did not, however, stabilize and instead declined through the 1990s and 2000s. The number of births in the province dropped from 12,700 in 1971 to 4,400 in 2006. Projections suggest that the number of births in the province will decline to 3,100 by 2021 (Newfoundland and Labrador, 2006). The lower number of births has had marked impact on the number of school children and university registrations at Memorial campuses. But declining fertility rates is only part of the problem: the proportion of school leavers qualifying to enter Memorial has also declined (Pippy, 2003). The University and individual Departments like our own face the double challenge of smaller populations of scholars combined with lower qualification rates for university.

Memorial University has responded to this demographic challenge by actively recruiting in other Canadian provinces and internationally. The university also engages scholars in the province through school visits. Faculty in the Geography Department have always participated in this last process, although its purpose is not to recruit students to the discipline; it is instead aimed at advising all students intending to study at Memorial. The university has kept student fees static for a number of years, which has no doubt helped stabilize student numbers. Despite these efforts, recruiting students to Memorial remains a challenge. Undergraduate registrations seemed to have stabilized at around 14,500, but they are far lower than the high of around 17,500 the university enjoyed in the early 1990s (Centre for Institutional Analysis and Planning, 2010).

Our own efforts in addressing the recruitment crunch have involved a range of outreach activities in schools, which are discussed in more detail below. As a Department we have come to the conclusion that the results of our own recruitment efforts in local high schools – which may lead to 5 or 10 new registrations in Geography annually – do not represent an effective use of our time. Instead, in the last few years we have focused our efforts on increasing registrations in our first year course in the knowledge that we can encourage students to continue onto second year and beyond. In other words, we are focusing on increasing the number of students to Geography who have already made the decision to study at Memorial.

There are several ways in which we have attempted to attract students to our first year programme. First, we have timetabled our first year course in slots that are 'popular' to students. We know, for example, that student registrations are far lower when we offer Geography 1050 at 9.00 rather than 11.00. Changing when we offer Geography 1050 is at least part of the explanation why we have been able to turn registrations around in the 2010/11 academic year. Second, we have made significant and ongoing improvements to our Geography 1050 class as a way of encouraging students to continue to second year and beyond. These changes are discussed in more detail below. Third, we have ensured that 1050 is taught by regular faculty rather than per course instructors. This policy ensures that we have experienced faculty (and researchers) teaching our introductory level course. Finally, we are working closely with the Academic Advising unit on campus so that they can communicate the advantages of doing Geography to interested students. We plan to continue with this approach to enrollment: we will let the university focus on improving recruitment to the university and we will, in turn, do our best to ensure that more students do Geography.

Enrollment in our **graduate studies** programme, in sharp contrast to our undergraduate programme, has increased rapidly through the 2000s (Table 3.4). Our graduate student numbers have almost doubled since the early 2000s. The numbers also show a rapid increase in both MA/MSc and PhD registrations. We have also had recent success in improving the student throughput. In the last three years our graduate student numbers have been around 50, with between 10 and 12 new registrations each year.

Fall registration	Total Students	MA / MSc	PhD	Graduations	Total graduations
2002	27	23	4	2 Masters	2
2003	30	23	7	1 PhD	1
2004	31	24	7	1 Masters	1
2005	26	18	8	6 Masters	6
2006	32	25	7	3 Masters	3
2007	34	24	10	7 Masters	7
2008	46	36	10	3 Masters, 1 PhD	4
2009	50	39	11	7 Masters, 1 PhD	8
2010	55	44	11	3 Masters, 1 PhD	4
2011	53	43	10	8 Masters, 2 PhDs	10

Table 3.4: Graduate student registrations and completions

The growth in the graduate programme is a direct consequence of increases in research funding, which we discuss in detail in Chapter 4 of our self-study document. We have also benefited from increased financial support from Memorial's School of Graduate Studies (SGS). The Geography Department currently receives the second highest amount of support from SGS within the Faculty of Arts. This is in marked contrast to ten years ago when we were second from bottom in support from SGS relative to other departments in the Faculty of Arts.

The way in which graduate students are funded within the Faculty of Arts varies considerably. Our approach is to offer students a 'financial package' that includes support from Graduate Studies ('baseline support') and support from a faculty member's research grant. The granting agencies vary

widely and include the tri-council agencies, the provincial government, national government and other public and private funding groups. A typical package would involve offering a student $18,000 per year for two years with $6,000 per year from baseline and $12,000 per year from a faculty member's research grant. This approach to student support has allowed us to increase the number of students we admit, far beyond what would be possible if we relied on SGS baseline funding alone.

Space is at premium at Memorial, but we have nonetheless been able to provide all of our graduate students with shared office space. The offices have dedicated connections to the university's network and students have access to a networked printer. Ideally, we would like to reduce the number of students per office, but given the space crisis on campus, this is a difficult task. If we did find additional space it might be away from the Geography Department and this would reduce a sense of collegiality and community that is so important for a successful graduate programme.

One of the recommendations of the 2001 APR was that we provide opportunities for PhD students to teach undergraduate courses. Our Department does not normally have many courses taught by per course instructors, but when we do they are almost always taught by senior graduate students. This is one way that we have responded to this specific recommendation made by the APR. There are other routes to teacher training for senior graduate students, which we have also encouraged our students to use. In 2005 Memorial introduced the Teaching Opportunities for Graduate Students (TOGA) initiative. TOGA was aimed at providing professional development to support graduate students in their role as teaching assistants. There were three levels to TOGA: teaching assistant (TOGA 1), teaching associate (TOGA 2), and teaching apprentice (TOGA 3). Geography was one of 12 Departments that participated in the TOGA pilot project. Graduate students in Geography have also enrolled in the Graduate Programme in Teaching (GPT) to develop their teaching skills. The GPT programme is run through a partnership between the Graduate School and the Instructional Development Office. There are two components to the programme: first, the student engages with a faculty member teaching an undergraduate course as a teaching apprentice. The student attends the lectures and may also give one or more lectures. The second component is a weekly seminar session where the students learn teaching strategies and techniques.

Graduate students in Geography are an integral part of our academic programme. We have been able to provide graduate students with shared office space, which is a significant achievement given the space crisis at Memorial. Graduate students participate in our weekly blue-box seminar series in the audience asking questions or as seminar presenters. Masters and PhD students are required to present the results of their research at least once during their programme. Graduate students also present their proposals at a one day 'proposal conference' which is held every year in April. This gives the Department the opportunity to comment and provide feedback to students before they begin their field research. At the beginning of the academic year we also have a short orientation programme and we have become more active in arranging a social event for incoming graduate students so that they can meet faculty and in-programme students in a more relaxed environment.

Our graduate students have been very successful in securing external grants for their studies. Recent SSHRC awardees include Ryan Gibson (2009, Phd), Ahmed Khan (2009, PhD), Amy Tucker (2009, MA), Jean Sebastien Boutet (2009, MA), Jennifer Daniels (2010, MA), Carly Sponarski (2010, PhD), Andrew Song (2010, PhD). Given the northern focus of much of our work, our graduate students have also had significant success in securing field work funds from the Northern Scientific

Training Programme (NSTP). Our graduate students have excelled at conferences, where they are regular recipients of 'best paper awards'. Most recently, Rudy Riedlsperger and Scott Hatcher received honours at the most recent ArcticNet conference held in Ottawa in 2010 for their poster presentations. Two of our graduate students have also been awarded the prestigious Garfield Weston Award for Northern Research (Dominique St-Hilaire (2008) and Robert Way (2010)). This is a national award administered by the Association of Canadian Universities for Northern Studies (ACUNS), an agency dedicated advancing educational opportunities for northern residents and research on northern issues. These awards reflect the excellence of our graduate students and the support of their supervisors.

Student survey: Fall 2008

In preparation for our programme review we conducted a survey of undergraduate and graduate students in which we asked a range of questions regarding teaching and learning in Geography. The survey was undertaken by Memorial's Centre for Institutional Analysis and Planning (CIAP). The survey was administered in late 2008 and the results were produced in March 2009. There were three components of the survey: first, a survey of students registered in Geography 1050; second, a survey of students registered for courses at the 2000 level and above; and third a survey of current and past graduate students. The number of students surveyed for each section was as follows: 165 first year student surveys, 198 second year and above student surveys, and 15 graduate student surveys.

In the **first year survey**, students answered questions about their reasons for registering for Geography, whether they planned to register for additional courses in the future, and their reasons for choosing (or not) to register for additional courses in Geography. In terms of the decision to register most students declared their interest in the course material as their primary reason (62 percent). The need for an elective (44 percent) and the fact that the course was in a convenient time slot (18 percent) were two other reasons cited in the survey. Only 9 percent of students cited the reputation of the instructor and only just over 6 percent indicated that the reputation of the course played a role in their decision to do Geography. These last two figures suggest that we have work to do in ensuring that students are more aware of the reputation of our instructors – particularly given that several of faculty have won important awards. Improving the reputation of our first year course is something that should happen as the course itself is enhanced. There is a well-developed system of information exchange on campus on popular courses, which is no doubt facilitated by social networking technology.

The first year survey also posed questions on whether students were considering additional courses in Geography beyond 1050. As we have noted earlier, encouraging students to continue on in Geography is an important goal for us. Of the 165 students surveyed 55 percent said they were 'inclined to register' for more Geography courses in the future. We also asked those students who stated that they were not planning to do additional courses in Geography the reason for their decision. Significantly, over 44 percent stated that the main reason was timetabling clashes. We know that this is a major problem at Memorial. Many of the students we advise find it very challenging to plan their programme schedules, especially when they have declared two Majors. It is difficult for individual departments like our own to address this problem as it is a university wide challenge. At the same time, there may be opportunities for raising this issue in Memorial's emerging university teaching strategy and plan. The second most frequent reason for not doing

additional Geography courses was in the category 'other' (27 percent). Two specific reasons were cited here: first, the student had taken the course as an elective and second, the student was close to completing his/her degree. The last two reasons why students said they were not interested in pursuing Geography was a lack of interest in the subject matter (20 percent) and a heavy workload (8 percent).

The survey **of students in second year** and above led to 198 responses. Students were asked why they chose Geography as a Major and they were provided with a reasonably wide range of choices; respondents were allowed to chose two categories reflecting their reasons for majoring in Geography. The highest category of response was 'interest in the subject' (72 percent) followed by 'preparing to enter a specific job or career' (52 percent). The third and fourth ranked responses were to 'further career and professional development' (21 percent) and 'personal development/fulfillment' (19 percent). Low on the scale of responses was 'quality of the programme and reputation of the department' (4.6 percent). A consistent result in both the first year and beyond is that students register for Geography courses out of interest in the material rather than on the reputation of the Department and its faculty. This is an area we will continue to work on as we develop our strategic objective of *Articulating the role and place of Geography* at Memorial and beyond.

Students in second year and above were also asked questions about their learning experience in Geography, the support they received from faculty on academic advising, and on our effectiveness in contributing to student development. Students were required to respond on a scale of 1 to 5 with '1' representing strongly disagree to '5' representing strongly agree. A positive result was that a very high proportion of the students agreed that instructors were 'reasonably accessible' outside of the classroom (4.25). Students also felt strongly that they were treated with respect by their instructors (4.51) and that the instructors resolved their course related problems (4.35). A less positive result was the answer for teaching assistants and laboratory demonstrators: with a result of 3.57, not all students agree that teaching assistants are a 'valuable resource' to them in their courses. In terms of the learning experiences questions focused on whether courses were available, whether course objectives were clearly stated and whether the course material was up to date. The response to these questions ranged from 4.2 to 4.05, suggesting that there are not major problems in this area. A notable low result in the learning experience field (3.50) was the response to the question of whether the Department fostered a sense of community among students. The Department does have a formally constituted student society, MUGS (Memorial University Geographical Society). The response here suggests that the Department should work more closely with MUGS to improve a sense of community amongst our students. The last set of questions on learning experiences focused on student development in six areas: writing, speaking, critical thinking, desire for further education, ability to work independently and work well with others. The 1 to 5 scale ranged from 'not at all' to 'a great deal'. The responses to these questions were moderate to high ranging from 4.18 (ability to work independently) to 3.32 (the development of speaking skills).

The last set of questions for second year and above students focused on whether they would recommend Geography courses to other students and for what reasons. A pleasingly high proportion of Geography majors said they would recommend this course to other students (79.5%) and only 2.6 per cent said they would not recommend the course (17.9 per cent said they didn't know or were unsure). The reasons why they would recommend the course included enjoyable/interesting programme (49 per cent), enthusiastic and helpful professors (27.5 per cent) and their ability to chose an interesting stream amongst the varied course offerings (14.2 per cent). Only 2.5 per cent cited a

sense of community as a reason for suggesting Geography as a course, a result that is consistent with earlier responses on this issue. The last question for second year and beyond students asked respondents to identify one change they would recommend to improve their educational experience with the Geography Department. The most frequent response was to improve course scheduling and to offer more courses (13.7 per cent) followed by a wider variety of courses (11.1 per cent) and more field schools and hands on learning (9.8 per cent).

The survey of undergraduate students has provided the Department with some important insights into why students register for geography, with potential implications for how we increase registrations. Clearly students register for geography because they are interested in the subject matter, but they are not aware of our reputation as teachers and researchers. This is an area we can work on in the future. Students cite timetabling as a key problem; we will continue our efforts to timetable in a way that makes it easier for students to register for Geography courses. Unfortunately, this is a university wide problem and so there are limits to what we can do to limit timetable clashes.

The survey of **graduate students** conducted in Fall 2008 has provided us with equally useful and important information on our graduate programme. The Department supplied CIAP with 78 names of current and former graduate students and 15 students completed the survey.[2] The low response rate was almost certainly a consequence of the survey method. While undergraduate students completed the survey 'in class', existing and former graduate students were contacted via emails that we had on record. The emails may have been outdated and the response rate to online questionnaires tends to be lower.

The survey asked graduate students to respond to questions on their learning experience, programme support and funding, research experience and an overall impression of their experience as a student in our graduate programme. In terms of learning experience, the responses were generally very positive: 11 of the 15 students agreed or strongly agreed that their supervisor was a supportive mentor. In addition, 12 of the 15 students said that the programme was intellectually stimulating. In terms of the culture of the Department, 9 of 15 students agreed or strongly agreed that the Department fostered a sense of community. As we noted earlier in this chapter, we have worked hard to address this issue amongst our graduate students. In response to the question of programme support, 13 of the 15 students answered 'yes' to the question on whether the courses were appropriate to their research programme. Graduate students in the Geography Department are funded through a combination of supervisor grants and baseline funds from the School of Graduate Studies. According to the survey results, our graduate funding system is allowing students to complete their degrees: 11 of the 15 students responded in the affirmative to the question of whether their funding duration would allow them to complete the degree in a timely manner. The section on 'research experience' asked students to respond to questions on research in Geography, on student-faculty interactions and on the interdisciplinary nature of the programme. In all three of these areas most students (between 10 and 13) agreed or strongly agreed that the research was interesting, that there was sufficient faculty-student interactions, and on the attraction of Geography's interdisciplinarity. The last item focused on graduate students' overall experience in the Geography graduate programme. The responses were very positive: 12 of the 15 respondents said they would recommend the programme to other students (1 said 'no', and 2 said 'I don't know'). The survey

[2] CIAP's description of the survey method notes that 14 graduate students completed the survey. Yet the results consistently indicate a sample size of 15. For this discussion, we are assuming that the sample size was 15.

also asked students an open-ended question on the main strength of Geography's graduate programme. The students cited the high quality of faculty and staff, the interdisciplinarity of the programme, the diversity of research topics, and the ability to learn practical research skills.

The last section of the graduate survey focused on whether their graduate training and experience had prepared them for their current careers. Of the 15 students surveyed, seven were working in sectors that they described as research (4), academic (3), government (2), non-profit (2) and health care (1) (students were able to select more than one option). The survey suggests that their degree was important in terms of them being selected for the position: 6 of the 7 respondents said that their graduate degree in Geography was important in terms of them being selected for the position. Graduate students were also asked whether their programme related to their current job. The results suggest a difference between general training and specific on the job skills: 6 students indicated that the subject area of their graduate programme was relevant to their current job; similarly 6 students confirmed that the general skills and perspectives they acquired during their graduate programme were relevant to their current positions. However, only 3 students said that the 'programme specific skills' acquired in Geography were relevant to their current positions. Without additional information it is difficult to assess the significance of this result. It may be that we are not providing students with sufficient specific research skills. At the same time, however, it may be unrealistic for us to consider trying to offer the wide range of skills and techniques students are required to use at work. In terms of whether their graduate programme had, in broad terms, prepared them for the world of work, 4 said it 'prepared them well', 2 said it 'prepared them somewhat', and one said that it did not prepare him/her well.

The graduate student survey has provided some indication of what we do well: we are good mentors, we are recognized for our high quality research, our programme appears to prepare students for careers outside of the academy, and we provide sufficient funding for students to complete their degrees. We will continue to work on ensuring that graduate students know how important they are to our research programme and we will explore the issue of 'programme specific skills'.

Curriculum Change and Innovation

In this section we document some of the most important curriculum changes we have introduced since the last APR. These do not include the ongoing changes made by faculty within their courses, which are too numerous to mention. We focus instead on programme restructuring and major course innovations.

Geography 1050

At the time of the APR in 2001, the Geography Department offered two first year courses: Geography 1011 and 1011. All majors and minors in Geography had to complete both Geography 1010 and 1011. Geography 1010 was a three hour per week lecture course which focused on several main themes in geography. The Geography 1010 course offered in Fall 2000, for example, had units in climate, maps, culture and political geography. Geography 1011 had three hours of lectures per week and a three hour laboratory section where students worked through topographic map skills, climate and population data, and landform analyses. As a department, we had decided that we wanted our students to have a combination of lecture/lab experience in order to proceed with courses at the second year level. However, we were noticing that the numbers of students registering for

Geography 1011 (with a 6-hour/week commitment) were less than 100 per term. Numbers of majors and minors were decreasing as well.

The 2001 APR recommended that we devise new course titles for Geography 1010/1011 that were more appealing to prospective students. The Department decided that it was an opportune time to not only change the course titles, but to overhaul the first year programme to address issues of student enrolment as well as curriculum revision. The changes that are outlined here represent the consensus of a committee of faculty members who had been regularly teaching the first year courses. These meetings were held during the 2001-2 academic year and a new course, Geography 1050 was developed to replace the former Geography 1010/11. Geography 1011 was offered for another academic year to serve students who had already completed Geography 1010.

The main challenge of replacing two courses with a single one at the first year was in the choice of an appropriate curriculum. We decided to focus on the integrative nature of Geography in the new 1050 course. Students have to do 2000-level courses in cultural, economic, mapping, physical and resource geography, so they will get sufficient foundational information in those core courses. We wanted the first year course to focus on specific subject matter, but to integrate physical and human geography and, in so doing, integrate the different units of the course. Students would be shown how climate is interrelated with population and landforms and culture and that maps and other geographic tools are used to display spatial information. We wanted to lead students through a course which would not only show this holistic approach to our discipline, but which would form much of their information base in geography as well as begin to develop their skills in critical thinking.

We decided initially to have five units in the Geography 1050 manual: maps, remote sensing and GIS, cultural geography (focus on religion), climate change, urban geography and coastal geomorphology. There were no texts on the market which were appropriate to our approach, so we each took charge of a unit and wrote a set of notes for the students. These were then printed in a course manual for the students. The other required reference was the Oxford World Atlas which formed the basis for the geographic literacy component of the course which will be outlined below. We used these units for a few terms and have since substituted others: population for culture, political for urban, food for landforms.

About five years ago, we entered into an agreement with McGraw-Hill Publishers to develop a custom manual based on our own notes and some chapters and illustrations from one of their introductory texts. This is made available to the students at a reasonable cost (~ $30). McGraw-Hill provides the Department with a royalty cheque each year which we then use to support the purchase of materials to be used in teaching.

Those of us teaching the Geography 1050 course share our resources with our colleagues: powerpoint slides, website links, films and videos. We meet regularly and discuss new approaches. We try some and keep them, others we decide to abandon. But the bottom line is that we do all of it in a collegial manner, sharing as we go. The Geography Department has a commitment to quality teaching, especially at the first year level. Therefore, those who are assigned to teach Geography 1050 are normally experienced teachers with a keen desire to be involved with the introductory course.

Geography 1050 course components:

- Atlas quizzes. These are a highly structured component of the course. They are a response to the very low levels of basic geographic literacy amongst our students. When we started these in Geography 1050, there were eight quizzes per term. Students were responsible for the countries, capitals and major physical features in a given area (e.g. Europe). They were given the blank study maps and used their atlases to prepare for the quiz given during the first 10 minutes of, say, Monday's class. These quizzes were marked very quickly. The students had to be self motivated to memorize and develop their own world map knowledge. CEQ comments pointed to student satisfaction with this component of the course. Students said that learning about place name geography was never done anywhere else in their schooling. We have evolved the atlas quizzes over time so that this year we focused the different quizzes on the geographic areas covered by six regional trade agreements. The information in this handout is used in the last unit of the course in political geography. Students usually do well in the atlas quizzes. Each student has an atlas, so that we can use them for other aspects of the course. Hopefully they are kept as a general reference book.

- In-Class Exercises. The in class exercises are used for a number of pedagogical reasons. These provide the students with at least seven "hands-on" experiences during the term. This can range from topographic map work to drawing and interpreting population pyramids (see samples used this year). They break up the lecture and take the focus off the "one way delivery" of materials and get students working with their peers. These are not scheduled, so they provide an incentive for attending classes. These are marked and returned to students, providing the students with another chunk of evaluation. This provides a well needed break from the lecture format of our classroom with ~100 students.

- Term Assignment. The term assignment has always focused on a number of themes such as getting students to display and interpret spatial data. We have used data relating to climate change, food consumption, birth and death rates and refugee numbers. Students have to learn to use a variety of graphs and maps to show geographic patterns. (For several years, we have had student assistants at the library help us with tutorials for our students). The students then have to use some critical thinking skills to draw connections between the historical fiction in a film and the actual geo-historical events of the partitioning of India and Pakistan. Students usually relate very favourably to this integration of fact and fiction.

- Use of Graduate Students. What we do currently in Geography 1050 would be impossible without our graduate student teaching assistants. They mark the bi-weekly atlas quizzes as well as the in-class exercises. We insist that the student feedback is timely, so that they can use the skills learned in other pieces of work. Graduate students do not normally mark midterm or final exams or the term assignments. We have, in the past, attempted to incorporate the TAs in a more personal manner. We would give the 1050 students an open-ended question based on material covered in the day's class. The TAs would come to the class and take responsibility for a group in the class, discussing the question as a group. The students would then write their response and the TAs would evaluate the response. We called these written/oral discussions *inksheds.* Some of us felt more comfortable than others using this method of evaluation, so we did not continue after a year or so.

Geography 1050 has achieved its intended purpose. Enrolments in first year courses have increased, we seem to be attracting more majors and minors into the Department as they can do 2000-level courses immediately following 1050. We cover a wide range of foundational subject matter and introduce students to methods of looking at the world and displaying the patterns that emerge. Improving basic geographic literacy for around 600 students per year is also a worthwhile result of the new course.

Diploma and certificate programmes

Diploma and certificate programmes represent an important opportunity for students who wish to complement their studies in one or more fields of specialization with a programme that will help them relate their knowledge to growing sectors of the economy and to areas of increasing social concern. Diploma and certificate programmes assume and build upon an undergraduate degree.

These programmes are designed by 'packaging' of a number of courses into a recognizable entity (i.e. a Diploma) as part of the student's academic record. The choice of the areas of interests, for example 'Geographic Information Sciences' and 'Heritage Resources', was based on the availability of courses (as no new courses were normally being created for this), availability of faculty members to coordinate the programs, identification of students' poles of interests and evaluation of the demand from the workplace. The latter component is crucial to the success of the programmes because the industry and governments provide the main supervisory capacity for the 'exit' instructional field courses.

Within the Faculty of Arts, the Department of Geography is involved with the Diploma in Geographic Information Sciences (DGIS) and the Diploma in Heritage Resources (DHR); both consist of 30 credit hours in courses as specified in individual programs, including a field component of 6 credit hours in an approved instructional field courses. The courses completed to address diploma requirements can be also used to address some of bachelor degree requirements. When a student completes a bachelor and a diploma program, the minimum number of credit hours to be fulfilled is 126, compared to 120 credit hours for a regular bachelor program.

The *Diploma in Geographic Information Sciences* (DGIS) has been offered since 2001. This programme is of interest to students from a broad range of backgrounds. It is a valuable complement to social and natural sciences programmes such as anthropology, biology, computer sciences, earth sciences, history, economics, engineering, health and medicine, physical oceanography, environmental sciences and environmental studies. The fields of remote sensing, geographic information systems and cartography provide the most effective methods of gathering, managing, analyzing and representing geographic information. Remote sensing images provide resourceful information to observe and study the cultural and physical landscapes. Examples of remote sensing applications include the monitoring of land cover changes, environmental quality evaluation, natural resources exploration, assessment and monitoring, and archaeological site assessment. Geographic information systems enable the compilation, organization and processing of spatial (maps) and non-spatial (text, statistics, graphs) data. Socio-economic, political and environmental management decision-making is supported by the results of geographic information system analyses and modeling. Cartography involves the compilation, organization and visual representation of spatial

information. A variety of geographical information can effectively be communicated through cartography.

The DGIS draws on nine courses offered by the Department of Geography, one course of Computer Science and one Mathematic prerequisite. One of the faculty members from the Department of Geography involved with teaching courses required for the DGIS normally coordinates this program. Since 2003, 26 students have been granted the DGIS diploma (Table 3.5); three more students are currently enrolled in the last course required for the programme and are due to obtain a DGIS degree at Fall 2011 convocation.

Academic Year	Enrolment	Completed
2011	11	-
2010	12	2
2009	14	3
2008	14	8
2007	14	5
2006	7	1
2005	7	1
2004	11	5
2003	13	1
2002	5	-

Table 3.5: Registrations and completions, DGIS

The Department of Geography also participates in the *Diploma in Heritage Resources* (DHR) with three geography courses listed as elective: Geography 2001, 3610 and the Harlow Campus instructional field course Geography 3990. Faculty members from the various departments involved with offering this programme alternately coordinate the diploma in Heritage Resources.

Building on the student's academic grounding in anthropology/archaeology, folklore, history, geography, and other relevant disciplines, the programme offers training in object documentation, identification, conservation, and display. Required courses give students both an awareness of the broad range of heritage resources and specific skills to deal with public perceptions of objects and artifacts. Elective courses enable students to pursue their particular disciplinary interests. The DHR helps prepare students to work in the expanding heritage sector in Newfoundland or elsewhere. Students with this diploma will be better able to compete for positions in museums and historic sites and for employment with heritage consultants, and to participate in contracts involving heritage policy and planning. This diploma programme draws on the expertise of faculty members in various departments and faculties.

DHR enrolments and number of students who have completed the degree in the last 10 years; the first DHR degree was granted at May 2000 convocation (Table 3.6).

Academic Year	Enrolment	Completed
2011	4	-
2010	11	1
2009	12	7
2008	16	3
2007	18	4
2006	15	8
2005	17	6
2004	20	9
2003	17	8
2002	16	7

Table 3.6: Registrations and completions DHR diploma

The Geography Department (in particular Kelly Vodden and Charles Mather) has played an important role in developing the new *Certificate Programme in Regional Policy and Development* through the Division of Lifelong Learning in cooperation with the Leslie Harris Centre of Regional Policy and Development (Appendix 4). Launched in the summer of 2010, the Programme is designed to provide individuals with the knowledge and skills required to effectively work in the community and regional development sector, including professional employment within municipalities, planning agencies, social enterprises, not-for-profits, private sector, international development agencies, or provincial and federal governments. The programme fulfills a longstanding need in the province for a course in regional economic development.

The programme requires the completion of 32 credit hours as specified below. In addition to providing two of six required courses for this programme (Geography 3350, Geography 4320), Geography offers four of the Diploma's19 electives. Representatives of the Department (Vodden and Mather) participate in the programme advisory committee. The certificate programme offers an exciting opportunity for undergraduate students with a particular interest and concentration in development-related studies to advance to another level after the laddering first to fourth year courses. The mix of practitioners and senior undergraduate students in the programme provides for an exciting learning environment, where full-time students learn from the experiences of their practitioner peers and practitioners have the opportunity to engage in reading, writing and discussion about theories and concepts that can enrich and inform their community and regional development work.

Joint programmes

In collaboration with the department of Computer Science (COMP), the Department of Geography offers two bachelor programs, the Joint Major (B.Sc. only) and the Joint Honours (B.Sc. only). The Department also offers a Joint Honours bachelor programme with the Department of Earth Sciences (EASC).

These joint programmes have small registrations. In the last ten years, two students completed the requirements for the EASC-GEOG B.Sc. Honors requirements (2004 and 2008) and only one student completed the COMP-GEOG B.Sc. Honors requirements (in 2008). These programmes are very demanding academically and in terms of course scheduling. Students address these issues by alternating 'years' or a 'semesters' in one or another of the topics for a joint major. This helps

resolve conflict with scheduling of lab courses and to help with continuity of course programming between the fall and winter semesters offered in the participating departments. Two of the three students to have completed a joint major – (BSH) also completed a DGIS degree.

Field courses

The Department has always been committed to offering field courses on a regular basis in the undergraduate curriculum. As far back as 1970, Geography 3230/31 were offered during the end of each summer to students who were interested in learning techniques of field study in geography. These were most frequently held in the Corner Brook/Gros Morne area. In the 1970s, the course sections were different for students in human and physical geography. This changed in the 1980s when we collapsed the two courses into one and integrated the course materials so that many 'subdisciplines' within geography were featured in a particular year. The focus was usually related to the expertise of the faculty member leading in a specific year, but the intention was to provide a wide range of subjects and techniques to the students registered each August. Geography 3230 is offered to students every year. It is a mandatory course for honours students and is an elective course for others. Costs of accommodation and transportation have necessitated the course being held on the Avalon Peninsula for the last five or so iterations.

The 1980s also saw the start of our "*foreign field courses".* Individual faculty members (or a pair) took on the lead for the organization and running of two-week field schools in locales outside Newfoundland and Labrador. Field courses in the 1980s and 1990s were held in Southwest England, Ireland, Malta, Barbados, Spain, the Rockies, Southwest USA, Portugal and Romania. The high cost of these excursions has been a problem lately and there has not been an offering of a field course in an exotic location for a number of years. However, we are planning to mount a return trip to Malta in April 2012, which is being facilitated by the high commissioner for Malta based in St John's and the University of Malta.

In the curriculum discussions that followed our first Academic Programme Review, faculty agreed that it was desirable for our majors to have a 'mandatory' field course experience. Being out in the landscape was essential to a students' understanding of many of the concepts and approaches that we taught in our on-campus courses. Questionnaires that we had administered to our undergraduate students during our 2001 APR pointed to their fondness of field experiences and, indeed, their opinion that ALL students should have to do field courses as part of their major.

We introduced two mandatory field courses into the undergraduate curriculum in the 2005-6 calendar (although we offered them to a volunteer group in 2004-5). These courses were not to replace the more established Geography 3230, but to ensure that all of our students have the equivalent of a field course in their Bachelor's degrees. The two courses, discussed earlier, are Geography 2226 and 3226 and are run at the beginning of the Fall semester.

Many of our undergraduate courses have field components. They range from a visit to a museum or a walk around Long Pond to weekly 3-hour laboratories where students investigate the landscape of many areas in the metro area. Courses in Cultural Geography, Resources, Climatology, Geomorphology and Biogeography are heavily dependent on field work as part of their curricula. The CEQs often identify the field trips as the most enjoyable and effective parts of our courses.

Outreach activities

As a department, we have often discussed different ways that we can enhance our profile in the schools as well as in the general public. Geography in Newfoundland and Labrador has a poor reputation in the schools: it is often regarded as an easier subject for students struggling to succeed at high school. This stems from teachers' views on the subject and some of the naive ways that the media portray our discipline. About fifteen years ago we decided that we would concentrate our outreach efforts through three different initiatives: school presentations, teacher professional development and media coverage.

School Presentations: Many faculty and staff members in the department give presentations to specific classes in schools in the St. John's metro area. These range broadly in scope from kindergarten classes wanting to know more about dinosaurs to high school students needing particular applications in GIS. These occur in a somewhat *ad hoc* fashion where teachers/schools contact particular people for help from time to time. Students and teachers usually respond well to these special classes. However, they are very time intensive on the part of those of us who organize the sessions. The effort perhaps is not really worth the impact of the outcome in these instances. The students probably do not even remember that their guests were Geographers, just that they were not their regular teachers.

In the 1990s the department was heavily involved in the annual promotion of *Geography Awareness Week* in November. This week long event was triggered by one enthusiastic social studies teacher in a local junior high school. She requested the participation of as many of us as possible to give class presentations on specific areas of research and interest to the students. Some years half of the department (faculty and staff) participated in this venture. Sometimes it went well, sometimes it went poorly. There was much geographic energy in the school for that week, but that was lost by the time the students went to high school and had to make course choices. There was never the same connection or energy with other teachers after some of the real leaders retired. The Department (Catto, Butler) also hosted five years of the provincial Geography Challenge. This is a national competition for junior high students held each spring. Several members of the department also participate annually in the offering of *Junior High Enrichment* courses during the spring. We have been doing this for about fifteen years. There have been courses in coastal geomorphology as well as a standard course in GPS/GIS/Cartography offered by Catto, Conway and Crewe (previously P. Brett).

Teacher Professional Development: The Department initiated discussions with several people in curriculum development within the provincial government's Department of Education as well as personnel in the Eastern School District. We met regularly one year with the Associate Dean of Education at MUN in order to develop and offer a summer school course in Geography teaching to teachers in the school system. Norm Catto organized and delivered this course.
Many of us (Catto, Butler, Bell, Devillers, Edinger) have offered in-service days for Geography teachers in the Eastern School District. These have been held here on the MUN campus as well as in individual schools. There have been many different themes to these in-services, some meeting with enthusiastic reception and others not so much. We have used staff (Conway, Crewe) as well as graduate students in the delivery of specialized workshops such as the use of GPS.

The success of these geography workshops led to requests from the Department of Education for our help in the offering of all of the field trips for the 2007 Canadian Leadership Conference for high school students from across Canada. Teachers and students alike benefitted from these guided excursions. A number of years ago Catto and Butler applied for a grant from the Canadian Council on Geographic Education (CCGE) to host a week long professional development course focusing on current trends in geographic education. We received $5000 to host the event, but it was never held because we did not receive sufficient registration numbers.

General Public and Media

In the last ten years or so, the Geography Department has been much more visible and vocal with regards to television, newspaper and radio interviewing on matters of geographic concern. Many people in the department are consulted regularly as experts in their field on climate change, coastal landforms, mapping and urban planning. Many faculty are engaged in research activities that have a natural applicability to general public knowledge and so these people are often heard on radio, especially. The success of the research projects such as lead in soil in St. John's and rural community development have tremendous interest to the public and are generously funded by the provincial government. For our 50th Anniversary this year, we decided to offer a series of talks for the general public at the Johnson GeoCentre. These have been held monthly from September to May and feature some of our best researchers speaking about issues of concern to many in the community. The audiences have been very healthy and the feedback has been quite positive. This is one effective way to advertise what Geographers do, and, at the same time, bridge the gap between 'town and gown'.

Future and 'in process' curriculum innovations

Geographies of the Arctic: In 2009/10 Joel Finnis offered a new fourth year course in Arctic Climatology. The response to the new course offering was extraordinary: over 35 registrations, far beyond what we normally expect in a fourth year course in Geography. The course attracted students from our group of Geography Majors, but also many students from Earth Sciences. There is clearly a great interest amongst our students for courses on the Arctic. In response, we are now offering a third year course in Arctic Geographies, which will be jointly offered by Arn Keeling and Trevor Bell. The combination of human and physical geography perspectives on the Arctic should provide an outstanding learning experience for students. And it will allow these two faculty members to bring their considerable research expertise on the Arctic to the classroom. There is also the potential to link these courses to the broader programmes, including the University of the Arctic.

Sustainability and global citizenship: We have discussed the idea of offering a course on sustainability and global citizenship at second year level that would be advertised to students across campus. The course would have been offered in the 2010-2011 academic year if we had not had a failed search for our environmental geographer position. Our plans were to offer the course in partnership with Memorial's Earth and Human Systems Sustainability Initiative (EHSSHI). This is a campus wide initiative concerned with increasing the capacity of society to deal with interlocking and complex global environmental issues. EHSSHI's mandate includes teaching, outreach, public education, policy development and the integration of environmental sustainability into Memorial's curriculum and practices. Geography faculty are active members of this initiative. Offering a course in sustainability and global citizenship in Geography, in partnership with EHSSHI, has the potential

of further raising our profile in sustainability issues while at the same time contributing to the goals of this important initiative.

Capstone course for Geography majors: Over the last several years the Department has discussed the possibility of offering a 'Capstone Research Seminar' at the fourth year level. The course would be integrative and research-based and would draw together core geographical concepts and approaches in an applied research context using contemporary geographical problems. As a problem-based learning course, it would also be collaborative and driven by field, lab and/or documentary research. The goals of the course include: providing a real world problem identification and solution-driven experience; providing an opportunity to work collaboratively in small groups with other students; integrating skills and knowledge gained from previous courses and experiences; an opportunity to practice the full complement of communication skills, including written reports and platform presentations.

In order to provide an authentic and integrative capstone experience, our plans are to include content that is based on the application of the methods of geographical inquiry to a contemporary research problem. It should encourage the integration of inter/trans-disciplinary perspectives, as well as foster collaborative learning. It may also include a co-operative learning or public interest component. Cases and research sites will likely be focused on the Northeast Avalon region. These might include: St. John's harbour development; land-use and environmental planning in the greater St. John's region; climate change and the Northeast Avalon; the East Coast trail development and its impacts; and others identified by course designers. Cases and topics might usefully examine in more detail sites visited during field school/field trip activities currently offered at the 3rd year level.

GISciences/Medicine postgraduate programme: Faculty in Geography and in the Faculty of Medicine have been collaborating on research projects since the mid-2000s. One aspect of this research has involved joint projects on epidemiology and community health using GIS technology. There is currently great demand for research expertise in this within the province and across Canada. However, research expertise is lacking: it is very difficult to find researchers and research assistants with expertise in *both* GIS *and* community health. A new initiative between Geography and the Faculty of Medicine is working towards addressing this gap in expertise. Two new graduate courses in Medical Geography have now been proposed and are being assessed by the School of Graduate Studies. The new courses will focus on the use of GIS and applied spatial analysis to health related issues and how to spatially integrate and analyze health and population data. This is a unique proposal in the field of Medical Geography given that it will be team taught by a GIS specialist in Geography and Epidemiologists and Clinical Practitioners in the Faculty of Medicine. Generally, Health Geography is taught within a Geography Department and rarely listed across disciplines. Thus, the courses will be open to graduate students in Geography, Epidemiology, Community Health, Public Health and Medicine who are interested in pursuing a career in Medical Geography. Initially, the courses will be offered as electives and if the demand is sufficient we intend to formally submit a proposal for a graduate programmein Medical Geography. The offering of the Medical Geography courses will provide new career opportunities for graduate students in Geography, Health and Medicine. In addition, these courses will provide opportunities for practicing health professionals to upgrade their skills.

Conclusion

The evidence we have presented in this section of our self-study confirms our commitment to teaching and learning in Geography. Since our last APR we have renewed and restructured our first year course; we have established or contributed meaningfully to several diploma and certificate programmes; and we have built a vibrant graduate programme that attracts outstanding talent from this province and beyond. These are the large and most visible achievements. Our commitment to teaching and learning means that we continue to improve our teaching within courses and by sharing experiences, new techniques and innovations.

For the future we have outlined a strategy for dealing with the demographic challenges that face the university and the province. We have also outlined several new initiatives that will no doubt attract new generations of students to the discipline. Most recently, we have committed ourselves to continual curriculum innovation by identifying this as one of our four key strategic goals. The growth in our graduate programme has been impressive, but expansion will require the three appointments, the motivation for which we outline in the next chapter of the self-study.

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4. RESEARCH

Introduction

The Geography Department's research output, productivity and impact have increased dramatically since the last Academic Programme Review (APR). This change has been achieved in part by responding to one of the key recommendations of the 2000/1 APR: that the Department should endeavour to hire individuals that will bring an active research profile to the unit (Appendix 1). We have been extraordinarily successful in hiring faculty who have very quickly established track records in research funding and publications. At the same time, senior faculty in Geography have substantially increased their research funding. The success of both new and established faculty has in turn supported the rapid growth of our graduate programme.

In this section of our self-study we provide an assessment of our research through six themes: productivity, impact, engagement, recognition, balance and integration. These themes emerge from the recommendations made by Memorial University in preparing the faculty contribution section of the self-study. The section on *productivity* provides an empirical assessment of how we have grown in terms of research income in absolute terms and relative to the Faculty of Arts. *Impact* refers to the quality and impact of the scholarly contributions of faculty and professional staff. *Engagement* is the extent to which we are, through our research, engaged with business, government, cultural and other relevant communities. *Recognition* is how our research is valued and recognised by regional, national and international professional organisations. *Balance* is about whether we are able to meet the competing demands of research, teaching and service. And finally, *integration* refers to our success in linking research and teaching. We illustrate our effectiveness in achieving these five areas through a discussion of a sample of innovative and important research projects underway in Geography. Our success in research provides the basis for a case we make in the concluding section, via a discussion of our research clusters, *for three new faculty appointments in the area of human health and security, hydro-meteorology and urban planning.*

This section of our self-study provides evidence for the extraordinary change in our research profile in the last decade. Yet much remains to be done. For example, we have identified research clusters (discussed in more detail below) and we have used these to profile our research particularly with the senior administration of the university. However, little has been done since then to make the clusters work to help us shape research agendas and to effectively position us within the university and beyond. We have also had an extraordinary successful public lecture series associated with the 50th anniversary of the Department (Figure 4.1). The aim of the 8 session presentation series was to make our research more accessible to the local community and there is no question that we achieved our goal. We now need to build on this success by providing new modes of communicating our research in a way that makes it both relevant and interesting to our local community. Finally, we have made concerted efforts to provide a forum for discussion of research ideas and project's through our Department's research committee and through our dedicated 'GeographyResearch' listserv. The role of this committee is also one of mentoring younger faculty, but we have yet to make this committee work to support the research efforts of younger and incoming faculty.

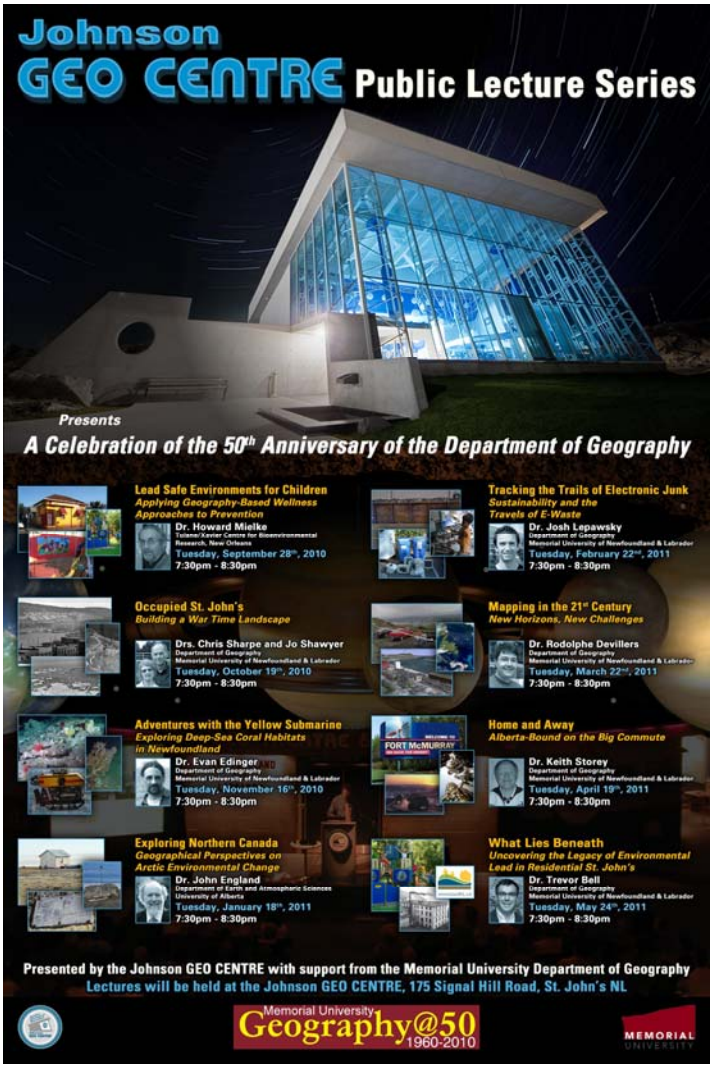

Figure 4.1: Geography's public lecture series 2010-11

Productivity

The Geography Department's increase in research funding and projects over the last decade has been remarkable. In 2001/2 the Department earned slightly more than $100,000 in research grants and contracts. By 2009/10 this figure had increased to well over a million dollars, more than a ten fold increase over a relatively short period of time (Figure 4.2, 4.3). The number of contracts and grants increased over the same period from 10 to almost 50 (Figure 4.3). The source of funding has included all three tri-council agencies (SSHRC, NSERC and CIHR). Significantly, we have also been successful in sourcing research funds from the provincial and national government, non-governmental organisations and international agencies (including the Atlantic Canada Opportunities Agency's (ACOA) Atlantic Innovation Fund, Research & Development Corporation, Industrial Research and Innovation Fund, Canada Foundation for Innovation, Municipalities Newfoundland and Labrador, Rural Secretariat, MITACS, Department of Environment and Conservation, Leverhulme Trust, World Wildlife Fund, Health Canada, ArcticNet). This remarkable increase has provided the basis for a rapid growth in our postgraduate numbers.

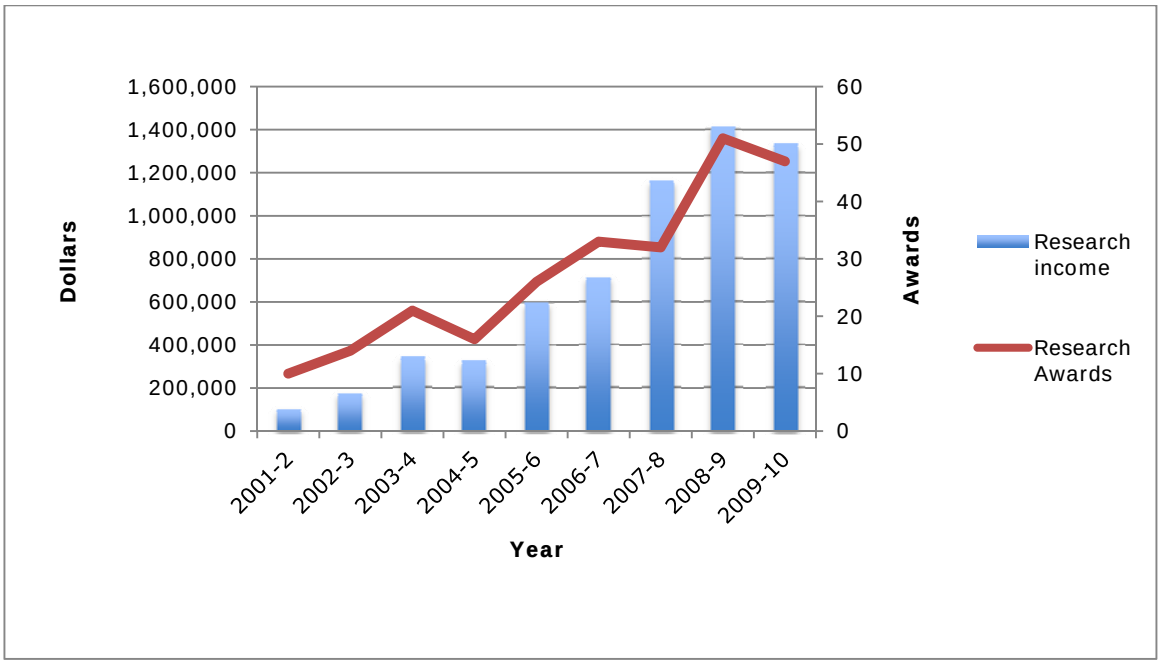

Figure 4.2: Research Income and Research Awards Department of Geography 2001-2010 (Source: CIAP reports)

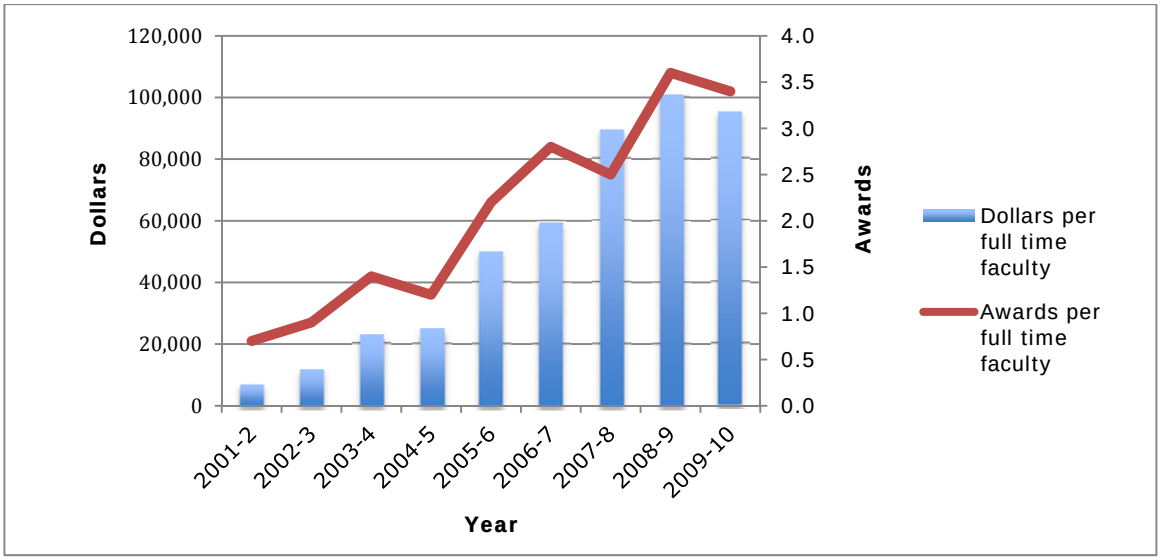

Figure 4.3: Research income in Geography per faculty member, 2001-2010 (Source: CIAP reports)

The Geography Department's contribution to the Faculty of Arts' research income has shown an equally rapid change. In the early 2000s we contributed less than 5 per cent of the Faculty of Arts' research income; by 2008/9 our contribution was close to 40 per cent of what the Faculty earned. The proportion of awards we earned relative to the Faculty as a whole has seen an equally rapid upward trend (Figure 4.4).

Our productivity in terms of publication output is perhaps more difficult to quantify and we are reluctant to engage in a detailed analysis of journal 'impact factors' or citations. At the same time, our CVs reflect the high quality of journals where our work appears (see faculty CVs). It includes the flagship journals in human geography, physical geography and GISciences. Our work also appears in the best interdisciplinary journals and in prestigious edited collections.

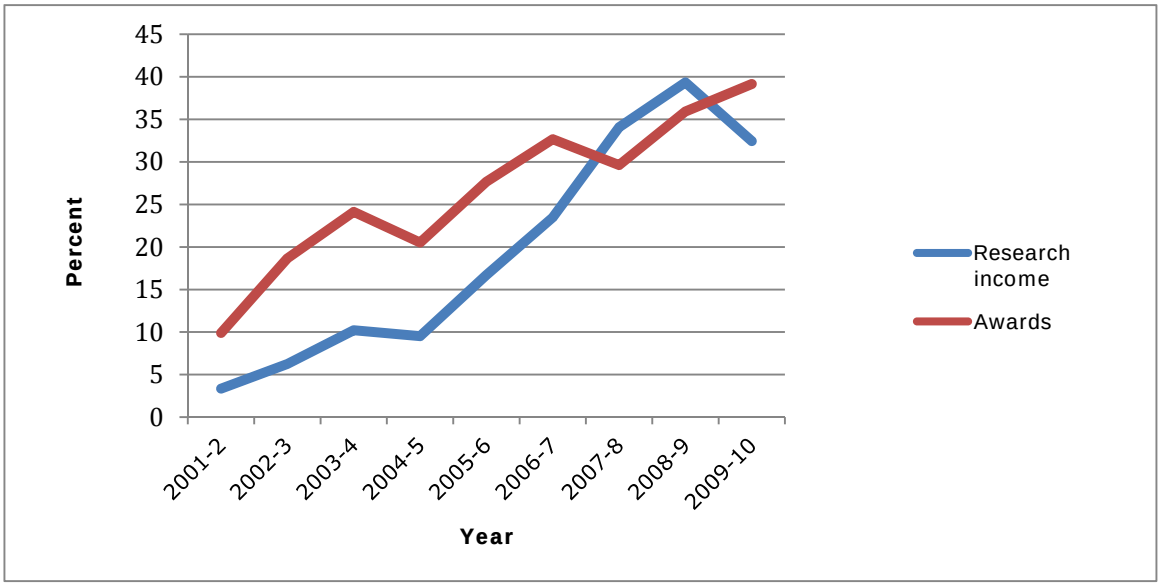

Figure 4.4: Research income and research awards relative to the Faculty of Arts (Source: CIAP reports)

The increase in research income and awards over the last decade has been an important measure of our success. It has ensured that we have become a Department known for its research intensity; these funds have also, significantly, allowed us to double our postgraduate complement. This success has not, however, come without costs. At a meeting with the VPR research and the Dean of Arts, which we discuss in more detail below, we were able to articulate these challenges through the metaphor of 'growing pains'. Our rapid increase in research productivity has placed considerable pressure on our administrators and support staff, and indeed on the support we receive from the Memorial's Office of Research. Ten years ago our financial administrator was dealing with 10 projects a year worth $100,000; now she deals with over 50 projects worth close to $1.5 million. Our office administrator previously managed 20 odd graduate students, but she now deals with over 50 students. The volume and complexity of the work carried out by our support staff has increase

dramatically. Given the increase in our graduate student population and our research income, we experience the challenge of space at Memorial disproportionately to other less research active Departments.

Figure 4.5: Geography's research 'growing pains'

Impact

This section is focused on the quality and the impact of our scholarly contributions. We highlight four projects: Ratana Chuenpagdee's coastal sustainability and governance research; Josh Lepawsky's work on electronic waste; Arn Keeling's work on Abandoned Mines; and Rodolphe Devillers' research on marine geomatics. These projects illustrate the significant impact that our research is having on the academy and beyond.

Towards Coastal Sustainability, Community Resilience and Good Governance: Ratana Chuenpagdee is a Canada Research Chair in Natural Resource Sustainability. Her research is interdisciplinary and focuses on issues related to coastal, oceans and fisheries governance. Her specific projects include environmental sustainability, community resilience, future of small-scale fisheries and marine protected areas. Ratana's scholarly contribution – which also has important policy implications – is the application of governance theory to integrated ocean and coastal management. This theory is now being applied in empirical research by colleagues and students in many different settings. Ratana has been very active in convening major international conferences to engage scholars around the world in a concerted interdisciplinary research effort on marine governance, small-scale fisheries, coastal community development, and integrated management.

Ratana has mobilised her research through the Fisheries Governance Network (FISHGOVNET), which continues to develop the conceptual framework for interactive governance, as well as testing it

in empirical settings around the world. These networks have allowed her to conduct original and leading edge research on coastal and ocean governance for sustainability and resilience.

Blurred borders: mapping Canada's role in the international trade and traffic of electronic waste
Since 2009 Josh Lepawsky and three graduate students have been investigating the international trade and traffic of electronic waste. The project is funded through a $248,000 SSHRC Strategic Research Grant. These funds are supporting research in Canada, Bangladesh and Singapore. In September 2011 the project will add an additional field site in Accra, Ghana where a fourth graduate student – Grace Akese – will investigate electronic waste.

Knowledge from the project is being mobilized in several ways beyond academic journal publications. For example, graduate students have presented findings from their research at academic conferences (Atlantic division of the Canadian Association of Geographers and the Canadian Association of Geographers). They have also participated in the United Nations Solve the E-waste Problem (StEP) Summer School in 2009 and 2010 (http://sites.google.com/site/ewastesummerschool/). Josh taught at the 2010 UN StEP Summer School and was subsequently asked to join the StEP initiative by the StEP Steering Committee (http://www.step-initiative.org/actors/steering_committee.php). As a consequence, Memorial University became the first and only Canadian representative on this international initiative that includes academic institutions as well as major electronics and software manufacturers in Africa, Asia, Europe, the US, and South America (http://www.step-initiative.org/actors/members_invitees.php).

Josh has been interviewed about his e-waste research or he has been asked to comment on related developments on several occasions by local, national, and international media. For example:

- 2010 Interviewed 11 March on VOWR Radio about his research on the geographies of electronic waste.
- 2010 'Global E-Waste Problem 'More Dire' than Realized'. TechNewsDaily. 28 February 2010. See: http://www.technewsdaily.com/global-e-waste-problem-more-dire-than-realized-0265/
- 2009 Interviewed 16 June for CBC Radio St. John's *On the Go* about his research on the geographies of e-waste.
- 2009 'Electronic Afterlife'. The McGill Daily online edition. 30 March 2009. See: http://www.mcgilldaily.com/articles/18916
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- 2008 'Today's new gadget gift could be tomorrow's e-waste'. Canwest News Service. Online edition, 25 December 2008. See: http://www.canada.com/topics/news/national/story.html?id=1113615
- 2008 'Criminals profiting from e-trash'. The Globe and Mail. Online edition, 22 August 2008. See: http://www.theglobeandmail.com/news/technology/article705535.ece
- 2008 'Electronic Wasteland'. The Telegram. Online edition 29 January 2008. See: http://www.thetelegram.com/Technologies/2008-01-29/article-1446157/Electronic-wasteland/1

Abandoned Mines in Northern Canada research group: This research group is based on an interdisciplinary collaboration between Arn Keeling in Geography and John Sandlos in History. Their project examines the historical geography of mineral development and mine abandonment in Northern Canada and has been funded through a SSHRC Research Development Initiatives grant, a Social Economy Research Network of Northern Canada sub-project grant, a 3-year SSHRC "Northern Communities" special call, and ArcticNet, for a total of over $500,000 in research funding since 2008. Sandlos and Keeling are also co-investigators in a new Major Collaborative Research Initiative called "Resources and Sustainable Development in the Arctic (ReSDA)." This funding has enabled extensive fieldwork, community-based oral history interviews, and archival research into each of five major case studies. Arn and John have dedicated considerable resources to graduate training and research activities: to date, they have recruited eight MA students in history and geography to work on the project. They have also sponsored the successful applications of two postdoctoral fellows connected to the project. Taken together, this group forms an interdisciplinary mining history research team that meets regularly to share insights and collaborate on research. In addition to theses and major papers, the group is planning for collaborative academic publications and other forms of dissemination, such as public history displays and the project website, www.niche-canada.org/mining.

The Abandoned Mines research programme has already generated considerable scholarly and public impact. Arn has one solo and three joint (with John) scholarly publications derived from this research, and he has presented results at national and international scholarly meetings. In recognition of their leading research on the historical geography of mining, the authors have been invited to participate in an international mining history workshop in Germany (June 2011) and Arn was invited to serve as on the advisory committee for the International Mining History Congress in Johannesburg in April 2012. The authors have also been invited to contribute to two forthcoming volumes, on northern environmental history and the environmental history of Canada. The mining project was profiled in Faculty of Arts (2008) and university-wide (2009) research reviews. In addition, the project has received regional and national media coverage from journalists seeking to better understand the impact of volatile minerals markets on northern communities. Aiming for a broader public exposure for this research, Arn recently published an article in the popular journal, *Canada's History* (formerly *The Beaver*). There is a strong potential for this research to reach policy communities – for instance, the authors and their collaborators at other universities are working with concerned citizens' groups and the City of Yellowknife to generate research relevant to the controversial Giant Mine Remediation Project.

Marine Geomatics: Rodolphe Devillers and several other faculty members in Geography (Trevor Bell and Evan Edinger) are involved in the digital mapping of coastal zones, mostly in Atlantic Canada. The research has a number of different components including marine habitat mapping, cold water corals and benthic ecology, acoustic seabed classifications, fisheries mapping and visualization and marine conservation. His work in this field has informed policy making, particularly in the area of resource management and environmental protection. The work on cold water corals for the World Wildlife Fund (WWF) has led to the establishment of a conservation zone in the South West region of the Grand Banks. Their contribution to marine habitat mapping has contributed to the Department of Fisheries and Oceans' efforts to delimit new ecosystem based management zones for

Newfoundland and Labrador. Finally, the marine geomatics work has contributed to the management plan for Gilbert Bay, the largest Marine Protected Area in the Atlantic.

Engagement

As the only university in Newfoundland and Labrador, Memorial has an important obligation to the people in the province. This commitment is stated in the University's 2007 Strategic Plan in which Memorial recognized its "special obligation to the people of Newfoundland and Labrador" (Memorial University 2007). The 2010 research plan confirms Memorial's mandate as "Newfoundland and Labrador's primary research enterprise" (Memorial University, 2010, 5). Our research is closely aligned with the commitment made in the 2007 Strategic Plan and in the more recent report on Memorial's new research strategy. In this section we describe research projects by Kelly Vodden, Charles Mather, Chris Sharpe, Alvin Simms, Joel Finnis, Trevor Bell and Norm Catto that illustrate our engagement with local partners including provincial, regional and local government as well as community groups and business.

Community and Regional Development in Canada and beyond: Kelly Vodden is an expert on regional development and her research programme is focused on the processes and structures that enable and constrain community and regional development in rural Canada. More specifically this includes two core streams: 1) rural and regional development governance; and 2) community involvement in natural resources management and adaptation to environmental change, as critical and often overlooked components of the "development" of sustainable rural communities and regions.

Kelly research is coordinated and funded through two key projects. The first is 'Rural-Urban Interactions - Understanding and Managing Functional Regions in Newfoundland and Labrador' (2007-2011). Kelly is a co-investigator on this project together with Alvin Simms and David Freshwater (University of Kentucky). Her second project is 'Canadian Regional Development: a Critical Review of Theory, Practice and Potentials' and is funded through the SSHRC. The four year "Rural-Urban" project, along with her PhD research, have made important contributions to the understanding of regional governance in the province and provide a solid foundation for the current SSHRC-funded project. Through this project Kelly is working with a team of leading rural researchers and graduate students from across Canada to undertake a critical assessment of the application and relevance of New Regionalism in the Canadian context; seek Canadian innovations in regional development; and understand how these innovations are evolving and if and if and how they are being shared across space in networks of policy and practice.

In addition to these major, multi-year projects, through research partnerships with MUN's Leslie Harris Centre and Government of NL Rural Secretariat's community-based research program, Kelly has led seven smaller research projects over the past two years (2009-2011) in collaboration with graduate (Gibson, Tucker, Lysenko, Mirza, Porter) and senior under-graduate students (Daniels, Peck, Woodford, Skeard). These projects have addressed locally-relevant research questions by combining the resources and expertise of rural regions with those of government and the Department. These projects provide an excellent opportunity for student training and university outreach while also contributing resources and knowledge to my overall research program. These projects have been funded through the Rural Secretariat – Executive Council, MITACS and the

Departments of Municipal Affairs and Innovation, Trade and Rural Development, Government of NL with a total budget of $83,189.

A global fish chain on the rocks? Charles Mather's research examines global value chains for food and fibre commodities. Together with Professor Barbara Neis from the Department of Sociology (and range of other stakeholders) he is examining the crisis in Newfoundland and Labrador's Northern Shrimp fishery using the value chain framework. The project is funded through Memorial's Harris Centre Applied Research Fund, the NSERC funded Canadian Capture Fisheries Network and the Community-University Research for Recovery Alliance. The team includes post-doctoral fellow Paul Foley, a political scientist from the York University, who will soon be completing his PhD on environmental certification systems for shrimp. The project has a clear commitment to finding solutions to the crisis in the Newfoundland and Labrador Northern Shrimp industry. The research project includes 4 case studies of coastal communities that are dependent on this fishery. In order to facilitate the engagement of stakeholders, we have engaged a key partner in this research, the Fish Food and Allied Workers Union (FFAW). The FFAW and other community partners will contribute to and benefit from the research

LeadNL: Trevor Bell is a co-investigator for *LeadNL*, which is the public name for an 8-year research project that is addressing questions about environmental lead exposure and children's health in the city of St. John's. Although the project is place-based in that it explores the environmental legacy of a four-century-old, non-industrial, North American city, it is one of the first in Canada that attempts not only to measure children's exposure to lead but also define and trace the sources and pathways of lead exposure in the residential environment. Its results are informing new national reference levels for lead in the home while supporting local community efforts to live with the legacy of lead in the urban environment (e.g. St. John's Safer Soil Project [safersoil.ning.com]).

Initial phases of the project focused on measuring the levels of environmental lead in residential and public spaces in St. John's, conducting human health risk assessment and completing a pilot blood lead surveillance program. Since 2009, the project has evolved into a full biomonitoring survey of children's lead exposure and represents collaboration between Memorial University (Geography), Eastern Health, and Health Canada. Funding since inception has been provided by NSERC (2004, 2005), Memorial University (2005), Janeway Children's Hospital research advisory board (2005, 2010) and Health Canada (2009-2011). Total cash funding to date is $432,100. The project has recruited and trained a full-time project manager, two full time research assistants, and over 50 part-time graduate and undergraduate student researchers. It has successfully supported two Masters in Public Health interns and three Masters of Science graduate students, two of which have pursued medical degrees.

A recognized strength of the project has been its outreach and community engagement (Appendix 5). Although the project was centrally managed by the principal investigators, they sought advice from an advisory committee composed of university scientists, representatives from local agencies and government departments, and a community representative. The project also engaged a stakeholder committee composed of representatives and communication personnel from local organizations, agencies and government departments who have either direct responsibility for human or environmental health in the city or may be receptors of our knowledge mobilization initiatives (e.g. Newfoundland and Labrador Housing).

Occupied St John's: Chris Sharpe and retired faculty member Jo Shawyer have been uncovering the previously unknown landscapes of wartime St John's. Their work has appeared in a recent publication edited by Steven High and published by McGill-Queen's University Press (*Occupied St John's: A social history of a city at war, 1939-1945*). Two very well attended public lectures based on this material were given in October 2010: one as part of the 50th Anniversary celebrations of the Department of Geography (Figure 5.1), and the other to a meeting of the Newfoundland Historic Trust. A significant outcome of this research has been the construction of a large photo mosaic of St John's compiled from 212 aerial photographs taken in 1948. The entire collection of photographs consisted of 313 black and white prints housed in the Provincial Air Photo library. The negatives no longer exist so the Geography Department's Cartographer, Charlie Conway, decided to scan all 313 photographs to preserve this important archive. The individual photographs were pieced together using object recognition software, a task that took 10 months to complete. The final copy of the mosaic is large and measures 52 by 78 inches (Figure 4.6). Since the publication of the book, *Occupied St John's*, the photo mosaic has taken on a life of its own with many inquiries on its availability. The City of St John's is using the mosaic to overlay the present-day street pattern to demonstrate the urban changes that have occurred since the late 1940s.

Rural-urban interaction in Newfoundland and Labrador: Alvin Simms' research is on rural urban interaction in Newfoundland and Labrador, with a specific focus on labour markets. He has already carried out considerable research on local workflows between communities and within regions in the province. His current project builds on this research through collaboration with the Newfoundland and Labrador Federation of Municipalities (NLFM) Community Cooperation Resource Centre (CCRC), Canadian Rural Revitalization Foundation (CRRF) and researchers at Memorial University and University of Kentucky. The project also has funding support from the Canada-NL Labour Market Development Agreement. The research team is working closely with community and government stakeholders. Existing workflow information will be combined with information on other forms of regional interaction and sustainability indicators to create tools that will help decision-makers at all levels better identify and predict the factors driving local labour market and sustainable development outcomes in their regions. Increased understanding will in turn lead to better informed local decision making and governance processes, improved sustainable development, labour force and economic development strategies. A key component of this work is close collaboration with the membership of the NLFM and other partners to ensure transfer of learning and best practices, pilot new approaches and communicate lessons learned to inform policy and programmes for all orders of government.

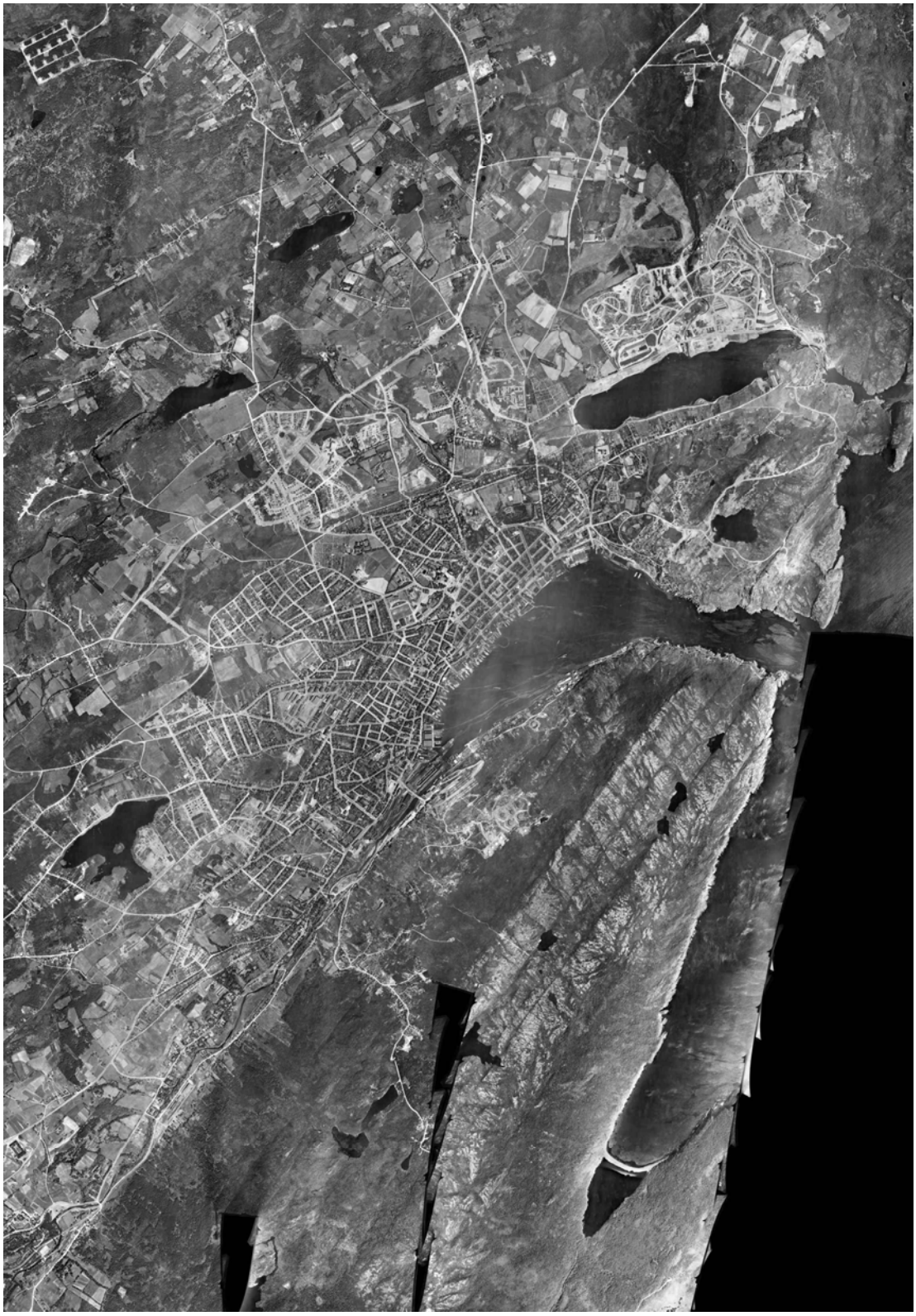

Figure 4.6: Photo mosaic of St John's in 1948

Climate dynamics, variability and prediction in the Arctic: Joel Finnis is a climatologist who joined the Department in July 2010. His work investigates climate dynamics, variability and prediction, with an emphasis on Arctic processes. One of the goals of this work is to contribute to climate adaptation initiatives through the efficient communication of climate projections to non-specialists. This research goal reflects the ongoing shift in climate research away from experiments addressing the potential for anthropogenic climate change, towards an emphasis climate services. In broad terms, this field focuses on the practical application of climate projections, operational forecasting, and effective communication with stakeholders. Modern climatology is itself intrinsically interdisciplinary, drawing from the fields of statistics and computer science as well as the full range of environmental & earth sciences; movement into climate services requires further collaboration with social scientists, government agencies, and communities. As such, climatology is gradually regaining its prominence in Geography departments, which offer a natural home to interdisciplinary and collaborative research. Joel's own research interests provide a bridge between the Geography Department and Physics & Physical Oceanography, Mathematics & Statistics, Earth Sciences, and Engineering, while filling a gap in atmospheric expertise at Memorial University.

New projects are currently being proposed with partners at the Centre for Cold Ocean Research & Engineering (C-CORE) to study the impact of climate change on a) offshore operations in the Labrador Sea and b) iceberg/ice island movement under a changing sea ice regime. In addition, Joel's research group is currently acting as an advisor to the Atlantic Canada Adaptation Solutions Association and the Newfoundland & Labrador Department of Environment and Conservation, assisting with the definition and description of climate change.

Natural Hazards in Newfoundland and beyond: Norm Catto's research projects, particularly those focused on Atlantic Canada, are conducted with a view to incorporating either societal or policy relevance, or both. An example is his work on natural hazard mapping in Newfoundland and Labrador communities, which has direct applications for communities and government, and informs decisions in terms of infrastructure maintenance, emergency measures, and mitigation. He has also been involved in impacts and adaptations with respect to climate change and variation in Atlantic Canada, involving documentation of impacts (negative and positive), documentation of adaptations in place, and suggestions for future applications, as commissioned by NL Environment and Conservation, NL Cabinet Secretariat, and Natural Resources Canada to inform policy-makers; coastal response to storm and wave activity; and exposure, sensitivity, and vulnerability to petroleum contamination in Newfoundland coastal communities.

Norm's expertise on natural hazards prompted the Department of Geography to organise a special panel session on the devastating impact of Hurricane Igor on Newfoundland (Figure 4.7). The panel included Joel Finnis who presented a meteorological analysis of the hurricane, and a local GIS company with close ties to the Geography Department. The aim of the panel was to both analyse and discuss appropriate responses to future hurricane events. We attracted a large crowd of interested parties including city planners and provincial government. The panel presentation was subsequently cited in the provincial legislature by the opposition party, which demanded a considered and effective response to future natural disasters.

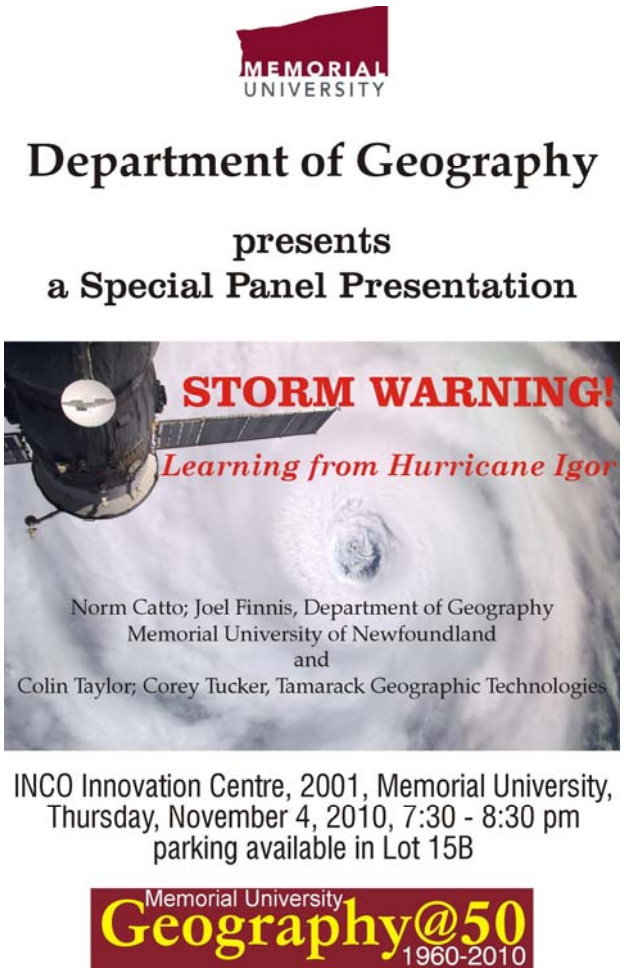

Figure 4.7: Panel presentation on Hurricane Igor 2010

Recognition

Our research is recognised within the province and beyond. In this section we highlight three projects: Evan Edinger's work on deep-sea corals, Rodolphe Devillers work on spatial data quality and Trevor Bell's research on climate change and adaptation.

Deep-sea corals in Newfoundland: Evan Edinger is an international expert on deep-sea corals in Arctic and boreal environments. He is part of three Canadian and one international research networks: the Canadian Healthy Oceans Network (CHONe, NSERC Strategic Network, based at MUN), ArcticNet (NSERC NCE, based at Universite Laval), the Community-University Research for Recovery Alliance (SSHRC, based at MUN), and Reef Budgets, (Leverhulme Trust, based at Manchester Metropolitan University, UK). In addition, Evan has been asked to help organize a Canadian section of "Cold-water carbonates in shallow and deep time" (CONCARDE, ESF, based at Fribourg University, Switzerland).

This research on deep-sea corals in Newfoundland has been particularly relevant to policy formulation. Evan established the research group in 2003 with Memorial and Department of Fisheries and Oceans (DFO) colleagues, with an initial focus on determining distributions of deep-sea corals based on fisheries bycatch. Since then the group has expanded to include studies of coral biogeography, fisheries impacts, importance to fish habitat, reproductive biology, habitat geology, longevity, sclerochronology and skeletal geochemistry, and nutrition based upon tissue geochemistry. Evan has had two major Remote Operated Vehicle expeditions (2007, 2010) to survey and collect corals in Newfoundland waters, both inside and outside Canada's Exclusive Economic Zone. In addition, through the CHONe network, Evan participated in a British Columbia and Washington State cruise in 2008. His deep-sea coral students within the CHONe and CURRA networks are studying sclerochronology and habitat geology (CHONe), and coral distributions based on fishers' ecological knowledge within the Northern Gulf of St. Lawrence (CURRA).

Evan's research on coral distributions, longevities, and fisheries impacts has had important policy implications for Canadian and North Atlantic Fisheries Organisation (NAFO) management of deep-sea fisheries in the Northwest Atlantic. DFO, NAFO, and non-governmental organizations have requested my advice on coral conservation, particularly identification and monitoring of Vulnerable Marine Ecosystems (especially deep-sea corals, sponges, seamounts and hydrothermal vents), in order to meet Canada's obligations under UN General Assembly resolutions. One of our most influential publications among government and NGOs was the coral bycatch report published by World Wildlife Fund Canada in 2007, while several of our papers have been widely cited in the scientific literature. Evan is frequently asked to review manuscripts on geological and sclerochronological aspects of deep-sea coral studies.

Spatial Data Quality: Rodolphe Devillers work in the field of GISciences focuses on the problems and risks associated with the use/misuse of imperfect spatial data. The risks of using inaccurate spatial data are particularly high when they are used to inform research and policy/planning. The work is funded through NSERC, but Rodolphe has a wide range of collaborators including GEOIDE NCE network that he co-leads with colleagues at Laval University, the University of Ottawa, the University of New Brunswick and the University of Melbourne. He has edited three books on the topic and he organized the International Symposium on Spatial Data Quality in St John's in 2009. Besides the edited collections his work has appeared in the flagship GIScience journals including *Transactions in GIS*. Rodolphe has become an international expert in the field of spatial data quality and is very active in training a new generation of scholars in this important research area. His work has been recognised by NSERC, which has awarded him a five year renewal of his Discovery Grant together with a prestigious Discovery Accelerator Supplement of $120,000 over three years.

Climate Change Research in the Arctic: Trevor Bell's research programme on climate change in the Canadian Arctic is multi-faceted but has at its core the study of coastal landscapes and communities in the context of climate change impacts and adaptation. Some main programme components are briefly outlined below. The programme is inherently collaborative, exploiting research networks such as ArcticNet and IPY CAVIAR to build links with physical, social and health scientists in university and governments. We have also developed substantial partnerships with Inuit governments and organizations, provincial, territorial and federal governments and northern industry. The project has involved post-docs (3), PhD (2) and Masters students (11) and northern expertise and attracted over $1 million in research funding over the past 5 years. As part of his commitment to the North, Trevor leads the Eastern Arctic regional impact study for *ArcticNet* and he sits on the NL

government's Working Group on Climate Change Adaptation in northern Labrador. More detailed descriptions of the various projects on climate change and adaptation are provided below.

Instability of Coastal Landscapes in Arctic Communities and Regions: Coastal zone research under this project across the Canadian Arctic is providing strong indications of changing landscapes and coastal stability in response to a changing climate. These trends represent hazards to coastal communities, infrastructure, habitats, and cultural resources. Synergistic patterns of change related to changing sea ice conditions, storm exposure, and warming permafrost indicate a potential for dramatic changes in the coastal zone and the stability of coastal landscapes at numerous sites from the southern Beaufort Sea to the central Arctic, the Baffin coast, Foxe Basin and Hudson Bay, Nunavik and Nunatsiavut. In places, shifts in environmental forcing and coastal response are on a collision course with the preservation of Inuit and Inuvialuit cultural resources and identity and for this reason they have high priority. Earlier and more dramatic climate change at high latitudes was projected by past climate model results and is now being experienced on the ground in Arctic communities. For this reason, there is a strong demand for robust projections of future change, including changes in sea level and coastal flooding hazards, precipitation and overland flooding hazards, coastal erosion, and landscape instability for input to climate-change adaptation planning and the mainstreaming of climate-change considerations across the spectrum of northern decision-making. This project has played a leading role in the acquisition of appropriate scientific data and provision of science-based advice to policy makers, planners, residents and other stakeholders in Canada's northern territories.

Climate change adaptation in Labrador: the role of values and cultural identity: Study conducted based on the premise of recognizing the cultural and geographical diversity of Labrador communities and the need for government and regional decision-makers to understand the breadth and depth of this diversity in formulating climate change adaptation strategies. Our research assesses perceived changes in weather and climate variability, ongoing adaptation adjustments in communities, and priority areas for future planned community adaptation in distinct Labrador regions. Our current research covers two specific Inuit and NunatuKavut settings in southern Nunatsiavut (Rigolet) and southern Labrador coast (St. Lewis).

Assessing the Vulnerability of Drinking Water Systems in Nunatsiavut: Assessment of the sensitivity of freshwater sources and the municipal water system to changing environmental and socio-economic conditions in Rigolet and Nain, Nunatsiavut, and the capacity of the communities to respond and adapt to these changes. The primary research objectives are to: (1) understand the present status of drinking water systems in Rigolet and Nain; (2) assess the vulnerability of these systems to present and future environmental and socio-economic changes; (3) develop a comprehensive understanding of the ways in which freshwater access is changing, how freshwater accessibility may change in the future, and the implications of these changes for community residents; and (4) assess the capacity of the communities to respond and adapt to these changes. Research partners include the Nunatsiavut Government, ArcticNet and the Nain and Rigolet Inuit Community Governments.

Landscape Hazard Assessment in Nain: Rapid infrastructure growth is a common reality of many northern communities today as governments respond to infrastructure deficits and over-crowded housing. The pace of community expansion highlights the need for the establishment of sustainable community development plans to ensure healthy communities. Planning in what are typically small,

isolated communities, however, can differ from the broad multi-faceted approach common to southern communities. Much of the planning focuses simply on basic housing needs, services and rudimentary transportation. Planning in northern communities also needs to reflect the importance and influence that the physical environment, extreme climate, and highly sensitive nature of the landscape has on development. The broad objective of this study is to produce a composite hazard risk map of the community of Nain that incorporates a baseline inventory of landscape-related hazards that reflect underlying surficial geology and geomorphology sensitivities. The hazard map is to be integrated into the community plan with the overall goal to promote human safety and security associated with existing and future infrastructure development in the community.

Case Studies of Climate Change Adaptation in Labrador & Northern Peninsula: Our case studies of adaptation to climate change have proven to be a successful tool for communicating climate change, while sharing tangible and meaningful examples of focused adaptation responses with local community leaders. Because the case studies are focused on the municipal and regional scale, the case studies provide relevant information to Newfoundlanders and Labradorians who are trying to make adjustments in their own local contexts. We have completed research on over ten case studies ranging from transportation issues, firewood access, water resources, recreation, coastal erosion and tourism/economic development. We have piloted and shared these case studies at regional workshops, provincial municipality association meetings and by invitation at government-sponsored symposia.

Understanding and Responding to the Effects of Climate Change and Modernization in Nunatsiavut: Inuit depend on the surrounding coastal ecosystem and its climate for harvesting, travel and way of life. Communities in Nunatsiavut recognize the increased pressures on their physical, personal, and social environments due to the effects of a rapidly changing climate, economic development, and political evolution. This project is conducting a baseline inventory and comparative assessment of four northern Labrador fjord based marine ecosystems. The goal of this ArcticNet-Nunatsiavut Government-Industry-Parks Canada partnership project is to address Inuit concerns regarding the ecological integrity of the marine environment in northern Labrador by acquiring a better understanding of the effects of climate change, natural resource extraction and contaminants. An integrated regional approach has been implemented to ensure concerns from all stakeholders, including community members and major industrial and governmental organizations are adequately addressed.

Integrating teaching and research

In 2009 Memorial University embarked upon a strategic planning process for research. Last year a parallel process for teaching and learning was initiated. The process for developing a strategic framework for teaching is coordinated by a working group of academics and senior administrators, who have in turn established 12 advisory committees. One of these committees is focused specifically on developing complementarity between the university's research and teaching strategies; as noted earlier in this self-study report, two Geography faculty serve on this committee. The underlying philosophy of the committee concerned with linking teaching and research plans is that:

> Engagement in research enlivens teaching. The engagement of students and the knowledge gained through teaching contributes to research activities. Rather than seeing one of these activities as subordinate to the other, it is when both activities are aligned to contribute to the other that a university community is able to make its biggest contribution to its faculty, students and society (Complementarity with the MUN Research Plan, 2011, 1).

Our approach to teaching in the Geography Department follows the philosophy articulated by the committee concerned with the complementarity between Memorial's research and teaching plans. In this section we explore two initiatives that highlight how we are integrating research and teaching.

Integrating regional development teaching and research: Kelly Vodden has linked her research on regional development problems, especially in Newfoundland and Labrador, to her undergraduate teaching in a unique and extraordinary way. Her 2009 Geography 3350 class project was designed in response to community and regional representatives from Gander–New-Wes-Valley area of northeastern Newfoundland. The community representatives were concerned about the gap between the status of their regional development plans and what was being achieved on the ground. Together with partners in the region, Kelly identified three key objectives for a community-based research process in which the students could be engaged. The projects included:

- Identifying critical success factors and barriers for small communities in moving from planning to plan implementation;
- Recommending steps that could be taken by local and senior government actors to maximize benefits and minimize challenges associated with these process; and
- Sharing lessons on effective community and multi-community socio-economic planning processes regionally and provincially.

Students were grouped in teams to investigate a planning process undertaken by one of the seven regions. The students were required to review background documents, conduct telephone interviews and they were involved in focus group discussions with community and government representatives as well as consultants involved in developing the planning documents. They then prepared case studies, which were presented in-class to their peers but also to regional participants including representatives from the Dept. of Innovation Trade and Rural Development, the Gander-New-Wes-Valley Rural Secretariat Regional Council, and Municipalities Newfoundland and Labrador (MNL).

The class project represented the first of a three-phased, collaborative, community-based research project initiated by the Gander–New-Wes-Valley Rural Secretariat Regional Council.
Phase 2 of the project involved comparison of the planning approaches used in each of the seven cases, and a workshop feedback session in April 2010. During phase 3 the regional results were compared to data collected from a survey of regional planners across the province as well as comparisons to findings from other cases in planning and rural development literature. Interested students from the Geography 3350 class applied and were selected to complete Phases 2 and 3 of the project under a research contract with the Rural Secretariat, therefore gaining additional experience and exposure to community and regional development issues and practice. Recommendations from all three phases were made to communities but also to provincial cabinet through a Rural Secretariat Regional Council policy submission.

Several students involved in this project have gone on to pursue further studies and/or employment in the development field, including one student who is now conducting a Masters in the same communities her team worked with in completion of their third year project, building on this experience and the relationships she formed. The project has also been presented at several academic conferences and in training sessions for planners across the province. It has also been features in MUN Today and in the News Digest of the Canadian Association of Geographers, where Rural Secretariat planner Tanya Nobole states: "I have been impressed by the enthusiasm, dedication and involvement of the students throughout the term. Recent presentations from the groups were well thought out, covered a great deal of material and were presented quite professionally." Brian Woodford, one of the students involved in Phases 1 and 2 the project, added: "This project definitely helps to promote cultural awareness. I'm from a rural area myself (Avondale) but I didn't know anything at all about the unique challenges faced by Fogo and the Change Islands."

Kelly's contribution to rural and regional development through this programme and through her research (discussed above) was recognised last year when she awarded the Newfoundland and Labrador Regional Economic Development Association (NLREDA)-Leslie Harris Award for Excellence at the Newfoundland and Labrador Community Economic Development. The award recognizes Memorial faculty, staff and students for their contributions in a number of areas, including linking teaching and research to the needs of communities and regional organizations, responsiveness in addressing requests for assistance from community partners and advancing the knowledge mobilization capacity of Memorial and/or the community to enhance university-community collaboration.

Teaching RADARSAT across disciplines: R2Read

Radar imagery is an important source of remote sensing data. The Canadian government has made significant investments in this technology because of its effectiveness in mapping a variety of land and ocean features. The government is currently in the process of planning the third Radarsat mission. The problem with radar imagery is that it is difficult for users to understand it from a visual point of view. Unlike aerial photographs and Google maps, which present spatial data in a visually friendly way (e.g. vegetation is green, water is blue, built up areas are white), radar images are more complicated and difficult to interpret. The difficulty of interpreting Radarsat images means that users are often reluctant to use it, despite its enormous advantages in the Canadian context and in other regions of the World.

Elizabeth Simms uses Radarsat images in the classroom and she has developed a unique way of overcoming some of the challenges of using these data. She has developed a website based instructional package that can be used independently by students to enhance their understanding of this important technology. Images sets of five Central and Eastern Canada locations illustrate interpretation examples of land cover types. The website shows information from different spectral bands and spatial resolutions of a given geographical area. The images interpreted recorded quasi-simultaneously by the Radarsat-1 and Landsat-7 satellite systems and near anniversary date by the Radarsat-2 provide a valuable comparative documentation for the understanding the information Radarsat images provide. Access to interpretation rubrics is set at regional and local spatial scales through image links. Thematic content is accessible from all image locations and conversely, all locations can be accessed back-and-forth to see examples featured in different geographical contexts.

The advantage of the website based instructional package is that students become familiar with a complex, but extremely important source of remotely sensed data. It has had an important impact on improving their employability as familiarity with Radarsat data provides students with a distinct advantage.

Balance

In this self-study we have demonstrated a commitment to balancing teaching and research. As we noted earlier, our approach is consistent with the University teaching plan that argues that teaching and research should be closely aligned. We also noted earlier that our appointments process for new faculty stresses the importance of teaching and research. It is equally important that Geography faculty are also able to contribute to service in the Department and the University, without these efforts compromising teaching and research. This is particularly important for faculty on tenure track. Faculty in Geography, across seniority levels, have been reasonably successful in being able to balance the competing requirements of teaching, research and service. There are, nonetheless, several 'institutional barriers', which we have identified including teaching equivalencies, timetabling, teaching credits and the role of teaching assistants. We will continue to work on these within the Department and beyond to ensure that our faculty are able to balance teaching, research and service.

Research futures

In late 2009 faculty in the Geography Department held a meeting with the Vice President Research (VPR) and the Dean of Arts. The purpose of the meeting was to allow the VPR to outline strategic initiatives coming out of his office for research at Memorial. We decided to use this opportunity to present our research, highlight our recent achievements, and raise some of the challenges we faced in reaching our goals. In preparing for this process we identified four research clusters, which have allowed us to present our varied research projects in a more coherent fashion. This is in contrast to previous efforts to present our research, which have relied on disciplinary distinctions (e.g. cultural, economic, physical geography). The four clusters are: Globalisation, economy and resources; Sustainable communities and regions; Climate and environmental change; Society, knowledge and values (Figure 4.8). The projects we have described above can all be placed within one of these four clusters.

Figure 4.8: Geography research clusters including proposed new cluster on Human Health and Security

Presenting our research in clusters has allowed us to identify research gaps, which will help inform our decision-making in terms of new faculty appointments. One key opportunity that we see for the future is in the area of *human health and security* (Figure 4.8). The idea of *human security* emerged as a key concept in the mid-1990s, partly through the work of the 1994 United Nations Human Development Report. The concept of security at the time was synonymous with national security; the UNDP report called for an expanded approach to security, which recognised that human security was not equivalent to national security. During the late 2000s the link between human security and health was established. Human health and security is: community focused and defined by communities; it is about recognising the vulnerability of communities and it aims to build the resilience of households in the face of environmental and economic crisis; and it stresses the nexus between protection and empowerment.

The human health and security cluster links closely with several specific research projects currently underway in the Department. For example, human health is a key issue in Josh Lepawsky's research electronic waste. The processing of e-waste in countries like Bangladesh and Ghana has serious health consequences for the people extracting and processing metals and other valuable products from electronic waste. Human health is also a key concern for Arn Keeling in his work on abandoned mines in northern Canada. The health impacts of toxic discharges and other mine related

pollution are serious and long-term, and have affected aboriginal communities disproportionately. Finally, human health and security are central to the research by Kelly Vodden and Trevor Bell who are exploring how communities are adapting and building resilience to the challenge of climate change.

Making this cluster real will require more than simply building links between the various research interests coalescing around health and human security. It will require *a new appointment*, beyond future retirements, that will allow us to realise the potential we have in this important field of research and teaching. We envisage that this position will have a strong northern and aboriginal focus, which will complement existing strengths and allow us to establish a regional expertise in this area, which is sorely lacking. Although the identification of this new position is guided by research concerns, we see this individual playing an equally crucial role in both undergraduate and graduate teaching.

We envisage *two additional* appointments, which also emerge through our exploration of research clusters. The *first* is in *hydro-meteorology*. The appointment of Joel Finnis in the position of climatologist has filled an important gap in our research and teaching programme. One of the important outcomes of his appointment has been recognition of the opportunity for strengthening this part of our research and teaching programme. Joel has established links with Physics and Physical Oceanography, where there is great interest in both climatology and meteorology, but little capacity for research and teaching in short term weather changes in the region. Within the province there is also a clear need for expertise on short-term weather patterns and their impact on rural and urban infrastructure. The impact of Hurricane Igor underlined the lack of capacity not only for forecasting extreme weather events, but also for assessing their human impact. A hydro-meteorologist would fill this gap and would complement existing expertise in climate and hazards in Geography.

The third new appointment is in the field of *urban planning*. Our sustainable communities and regions cluster is focused largely on questions of rural regional development. Or it examines the relationship between urban and rural, with an emphasis on the problems facing rural areas that are rapidly depopulating. There is no capacity within the province for teaching urban planning despite the recent and rapid growth of the St John's metropolitan area. A new appointment in urban planning will complement Chris Sharpe's historical research in St John's and his active involvement in areas of urban management and governance in the city.

Conclusion

The growth of research in Geography, in quantitative terms, has been extraordinary. Yet the significance of our contribution goes far beyond bringing more dollars onto campus: we have used these funds to upgrade the physical infrastructure of the university (i.e. laboratory space), we have trained a new generation of researchers in physical and human Geography and GISciences, and we have demonstrated the impact of our work on proximate and distant stakeholders including academics, government, business and communities. The message for Memorial University should be clear: *invest in Geography*. The returns of this investment to the university, to students and to the broader community will be rich.

5. SUMMARY

The Geography Department is a very different unit than it was ten years ago, when we first embarked on an Academic Programme Review. We have benefited significantly from faculty renewal: we are now relatively younger and more research intensive than we were, with a large and dynamic group of graduate students. We are known for our research intensity, innovation and excellence. Our profile within the Faculty and the University has, as a result, increased significantly. Despite these important changes, we remain committed teachers and educators. Our hiring practices underline the importance we place on teaching and our faculty continue to be recognised for the contribution to teaching within the university.

One of key goals of the APR process is to encourage academic planning and innovation. Since our previous APR in 2001, and particularly since 2003 when we started a process of identifying strategic goals, we have worked hard towards developing a culture of academic planning and innovation. We now have four high-level strategic goals that will allow us to sustain the important achievements we have made since our last APR. The specific goal that we have articulated in the APR is the appointment of three additional faculty, in addition to the replacement of retirees. Our motivation is based on what Geography has become in the last decade. We are a unit that attracts and nurtures the best talent in the discipline in terms of faculty and students. It has allowed us to grow as researchers while maintaining a tradition of excellence in teaching and research. Growing Geography's human resources is an excellent investment for the university and beyond.