

SIMON FRASER UNIVERSITY
OFFICE OF THE VICE-PRESIDENT, ACADEMIC
MEMORANDUM

To: Senate

From: J.M. Munro
Vice-President, Academic

Re: External Review of the Department
of Geography

Date: September 19, 1991

Attached is a summary of the report of the Department of Geography External Review Committee for the information of Senate. The review was discussed at the Senate Committee on Academic Planning, and the committee voted to receive the report.

The report of the Review Committee and the response of the Department is available in Secretariat Services, Registrar's Office, for any Senator who wishes to read the complete documents.

J.M. Munro

Attachment

/pjs

**Summary of the findings of the External Review of the
Department of Geography**

Review Committee members:

Dr. Donald Janelle	University of Western Ontario	(chair)
Dr. Derek Ford	McMaster University	
Dr. Allen Scott	University of California, Los Angeles	
Dr. Patricia Brantingham	School of Criminology, SFU	(internal)

Major Recommendations of the Review Committee:

1. Faculty hiring (replacement and growth) in geology, spacial information systems, and human geography is required.
2. There is a need to address the gender imbalance in the department.
3. Operating and capital budgets are below the level of similar departments in other Canadian universities and should be increased.
4. Provision of space (offices, teaching rooms, laboratories) is less than adequate. The Committee recommended that Geography expand in its present location into space which will be vacated by other units moving from the Classroom Complex. Alternately, a new building combining Geography and other units involved in Environmental Studies should be considered.
5. The undergraduate program was positively viewed by the committee, but questions were raised about the large number of undergraduate courses, the frequency of offerings. Suggestions about particular courses and areas were also offered.
6. The committee raised several major questions about the graduate program, in addition to commenting about the overall structure of the program and the length of time for degree completion. In addition, the Committee suggested that expansion of graduate enrollment be delayed until better facilities are available.
7. There is uncertainty about the role for Environmental Studies at SFU, and the Committee emphasized that members of the Geography Department should be integrally involved in the development of program plans in this area.

10 April 1991

A REVIEW OF THE DEPARTMENT OF GEOGRAPHY, SIMON FRASER UNIVERSITY

TO: VICE PRESIDENT ACADEMIC, DR. JOCK MUNRO
SIMON FRASER UNIVERSITY

FROM: EXTERNAL REVIEW COMMITTEE, DEPARTMENT OF GEOGRAPHY
Patricia Brantingham (SFU), Derek Ford (McMaster),
Donald Janelle (Western Ontario), and Allen Scott
(UCLA)

This report addresses three interrelated objectives. (1) It provides a general profile on the faculty complement of the Department of Geography, including an assessment of teaching and research commitments. (2) Resource, facility, and staff support are reviewed in relationship to the Department's ability for meeting teaching and research obligations. (3) The strengths and weaknesses of the undergraduate and graduate programs are discussed in detail. Where appropriate, recommendations are made. We gauge our assessment of strengths and weaknesses to what we know of other geography departments in Canada and the United States. Comparisons with other units within the Faculty of Arts and elsewhere in the University are avoided.

For the past 25 years, the Department of Geography at Simon Fraser University has contributed significantly to the development of geography in Canada. An early focus on Cultural geography gave the Department a distinctive identity. It also became known as a major innovator in social geography and a pioneer contributor to the development of automated cartography and geographical information systems (GIS). In recent years, the Department's identity has shifted more towards economic geography, environmental analysis, and physical geography. Recent faculty retirements, resignations, and reassignments have drawn from the general human geography side of the discipline. Appointments to fill these vacancies have focused on young scholars with PhDs from leading Canadian, British, and American universities. They add to the existing strength in physical geography and provide a significant boost to the prospects for human geography.

Seven of the 20 (19.25 FTE) current tenure and tenure track appointees in geography have joined the Department since 1985. This gives the Department an enviable demographic balance of senior people (one who retires in 1991 and five who are within 8 to 15 years from retirement), a mid-career cohort, and a set of young scholars seeking to establish teaching and research careers. Prospects for new appointments (growth appointments) in the next few years would give the Geography Department one of the youngest faculty complements of any geography department in Canada.

The Department has a congenial mix of people and the morale is, in general, high. We were impressed with the enthusiasm expressed by recent appointees. They described a supportive atmosphere and a high degree of intellectual excitement. There is a sense of cooperation, identity with the Department is strong, and there is a commitment to increasing the Department's productivity.

Combining the experience and leadership of established scholars with the energy and enthusiasm of younger academics gives this Department an unusual opportunity to make significant contributions to geography in British Columbia and in Canada. However, this will require careful and sensitive management to establish an identity for the Department, particularly in Human Geography. In addition, serious dedication by the University is needed to help the Department overcome what are probably the most severe space and resource constraints on any graduate-level geography department in Canada today.

I. Faculty

The Department identifies three general divisions of expertise: Physical Geography, Human Geography, and Spatial Information Systems. These areas of research and teaching are traditional to the discipline and are found in all Canadian geography departments. Brief commentary on teaching and research in these areas highlights strengths and weaknesses of the Simon Fraser department.

Physical Geography. The existing complement of physical geographers represents a research-intensive grouping that is viewed highly by the discipline. On average, members of this group are in mid-career and have established clear identity for their work. There is a good balance of expertise, combining significant strength in biogeography, climatology, hydrology, and geomorphology. Most members of this group have steady NSERC grants and have been successful in seeking external financial support from a variety of public and private sources. With the 1991 retirement of Professor Crampton, a replacement will be needed. While faculty expressed needs for expertise in a variety of areas (biogeography, forest ecology, glaciology, and applied geomorphology), the general consensus supports someone with background in pedology and geology. This would help to offset the lack of a geology department in the University.

Areas of recognized innovation include work on sedimentology of fluvial and deltaic environments (M.C. Roberts), Bailey's work on ginseng, and Hickin's work on river channels. There is, however, little evidence of joint research efforts among members of the Physical Geography group. Opportunities for joint work that could be explored include: links between Lesack's studies of aquatic and terrestrial ecosystems and Hutchinson's work on wetland ecosystems; linkage between Bailey's research on energy balances in

alpine tundra environments and Moore's interest in climatic variability and energy budgets in the snow regimes of alpine regions.

Among the more specific concerns for physical geography at Simon Fraser:

1. The physical geographers "feel uncomfortable" in the Faculty of Arts. Many other geography departments are in Arts, some are in Science (e.g., McMaster), some in Social Science (Western Ontario), some in Arts and Science.

The McMaster geography department has been much better served in resources by being in Science rather than Social Science (as was once proposed). However, the human geographers "feel uncomfortable" there. The matter has been largely solved by having them vote in Social Science elections (e.g., to Senate) and having them represented on all the important Social Sciences committees, e.g., Curriculum.

2. The Department is aggrieved at the lack of support from the Faculty of Sciences. The case made to us was that it graduates ~10% of the SFU BSc class each year, and ~5% of the MSc class. But it receives no financing from the Dean of Science.

In our meeting with him, the Dean of Science proffered few opinions. He did not seem to be interested in the possible roles of a Geography Department in his faculty. He stated that the geographers were not as enthusiastic about plans for the Institute of Environmental Research as he would have wished.

Human Geography. This general grouping of 11 faculty is diverse, covering the broad range of expertise needed in a modern geography department; cultural, historical, economic, medical, social, urban, and resource geography are included. This diversity is characteristic of most geography departments in Canada and provides a fertile base for innovation and for interdisciplinary linkage within the university. Areas of recognized strength at Simon Fraser include Hayter's work on the Canadian forest industry, Pierce's contributions to the geography of food and resource systems, Wong's work on water resources management in Southeast Asia, and Evenden's focus on Canadian suburban landscapes and the development of local government.

Recent faculty additions could form the nucleus of a strong identity for human geography in the Department. These include Nesmith's interest in gender relationships in rural development, Brohman's work on alternative paths to development in the third world, Hayes' focus on the geography of health care policy, Blomley's research on law and geography, and A. Gill's interest in

the social and behavioral aspects of development in tourist environments. These interests point to a focus that combines the geography of political economy with social theory and social policy. While maintaining the regional resource development focus (seen in the work of Hayter, Pierce, Wong, Nesmith, and Gill), the Department may wish to investigate ways of exploiting its apparent relative advantage in the linkage of political economy with social theory and social policy analysis. Maybe a department-sponsored publication series in this general area would help to assert an image for human geography at Simon Fraser.

Spatial Information Systems. This departmental specialty includes remote sensing, automated cartography, and geographical information systems (GIS). Expertise in these areas are vital to the Department, yet only two faculty members are associated with them.

A. Roberts combines unique strengths of airborne remote sensing capabilities with expertise in multispectral and digital image processing, along with archaeological experience. We were impressed with his innovative instrumentation systems and well-equipped (though crowded) lab.

Through the work of Tom Poiker, Simon Fraser took an early lead of international significance in the areas of GIS and automated cartography. However, in faculty complement and in facilities, the Department has not kept pace with developments in these fields. Throughout North America, the past decade has seen a rapid expansion in GIS technology and applications. It has been a primary growth area in the discipline and many departments have expanded their programs to meet market-place demands. In the United States, the National Science Foundation designated a National Center for Geographic Information and Analysis (NCGIA). Similar initiatives have occurred in Great Britain. From its start in 1988, the Association of American Geographer's specialty group in GIS has become the largest and most rapidly expanding specialization in the discipline. In Canada, most departments now have in-house facilities for GIS, equipped with a dozen or more micros and workstations. Pressing concerns for the SIS group include the lack of suitable space, and insufficient equipment and software for teaching purposes. These problems are addressed in Section III.

Faculty Complement:

In a period of extraordinary growth in student enrolments (see section IV on Undergraduate Programs), since 1984, the tenure-track faculty complement in Geography has expanded by only one one-half appointment (with the hiring of Cathy Nesmith in 1990-91). In addition, the Department has 2 limited-term appointees, including internationally recognized M.E. Eliot Hurst, and employs sessional instructors, including the Rt. Hon. E. Schreyer.

An expansion of the faculty complement is needed to address over-enrolment in courses and projected growth in the graduate program. The Department could make excellent use of two or three tenure-track growth appointments. Several general options for faculty growth appointments were suggested by the existing faculty. These included possible appointments in remote sensing, GIS, applied geomorphology, economic and resources geography, forest ecology, glaciology, and biogeography. While all of these suggestions are reasonable, we encourage the Department to develop a strong consensus on priorities for possible appointments. These must be matched with complementary strategies by the Department and the Faculty of Arts to ease the severe space problems faced by the department--either through expansion in the existing building or preferably through a move to a new facility.

The following suggestions are meant as constructive guidance to the Department in its establishment of appointment priorities.

1. We encourage a replacement, for Professor Crampton in roughly the same areas of research--geology and pedology. These are areas that complement most directly the existing expertise in physical geography and make up for, in part, the absence of these specialties elsewhere in the University.

2. A growth appointment in the area of Spatial Information Systems would help to reassert Simon Fraser's recognized leadership in this area and would relieve some of the demands on faculty. A person with strong creative abilities and teaching skills in automated cartography would permit existing faculty to focus more on GIS and on remote sensing technologies and applications. It would be useful if this person had an additional teaching/research interest in one of GIS, remote sensing, or quantitative spatial analysis.

3. A highly productive but relatively young appointment (possibly at the level of Associate Professor or Professor) might help to galvanize a stronger identity for Simon Fraser in the general area of human geography. This would require a person with leadership skills, who can work with existing faculty. The Department may be able to capitalize on its earlier image as a centre for work in cultural geography, but one that integrates this with emergent viewpoints and existing departmental expertise on the political economy of spatial systems, social theory, and social policy. Through accommodation, both established senior faculty and younger appointees should find a comfortable fit with such an approach. It's possible too that the leadership to bring this about may emerge from the existing faculty.

4. With only two women among 20 faculty, the Department faces the same gender imbalance found in many departments across North America. There is a strongly positive attitude towards

hiring more women scholars in the Department. Women now represent about one-third of all new PhDs in the discipline. But, while qualified women candidates will become increasingly available, competition to attract these individuals will be intensive for some time to come.

II. Governance Procedures.

The Department may find it useful to review its Constitution and governance procedures. Many of the recent appointees lacked awareness of decision-making procedures in the Department. In a period of growth and change, it is useful to distribute committee assignments so that recent appointees rotate through the various committees, gaining an overall understanding of Departmental operations.

Some members of the geography department spoke of rifts between the human and physical geographers. One or other group was perceived as being too influential, or it was feared that it would become so. This problem occurs in many other geography departments; in comparison to other universities, we do not assess the situation at Simon Fraser to be in any way severe. One solution that often works very well is to operate a Chair - Deputy (or Associate) Chair system. If the Chair is a human geographer, then the Deputy is a physical geographer, and vice versa. This is also a good means to "try out" potential chairpersons. The Simon Fraser department is large enough to support it.

III. The Adequacy of Resources Provided, Including Library and Computing Resources

Operating and Capital Equipment Budgets

The 1990-1 budget for Operating Expenses was \$78,000. We understand there was also a Capital Equipment grant of \$25,000, for a total of \$103,000. This is comparable to some other Canadian PhD-granting geography departments of similar size e.g., McMaster, Queen's. It is notably less than at the University of Western Ontario \$150,000 (which is soon to undergo some "budget compression") but significantly more than at McGill (which has already had its "compression"). As with all these other departments, the rate of increase of the SFU Operating budget did not keep pace with inflation during the Eighties, reducing real purchasing power by about one third.

Comparing the line items at Simon Fraser with the others, the SFU budget is notably deficient in two areas: (i) Field Travel-\$4500 (McGill-\$12,000; McMaster-\$19,000; Western-\$8,000). (ii) Guest Speakers- \$100 (McGill-\$1000; McMaster-\$3,300; Western-\$1500).

The Chair emphasized the need to increase the Operating budget to ~\$100,000. We agree that this would be a more appropriate figure than the present one. Maintenance of the Capital Equipment grant at or above \$25,000 for some years should take priority, however, because the quantity and quality of teaching equipment (including map and air photo sets) is inadequate.

The Library

We did not have the opportunity to tour the Library and inspect its holdings. However, there was a special meeting with the Head Librarian, the Serials Librarian and members of the geography Library committee.

The Librarians told us that the intent was to build an undergraduate library rather than a research-intensive one. Geography committee members, however, considered the book collection to be adequate up to the Master's level. The Geography Serials List indicates that the most important journals in most sub-fields of the discipline are held but there are many gaps amongst the secondary, more specialised titles. Geography faculty and graduates must expect to have to use the resources of the UBC library upon occasion.

The undergraduates suggested that there were insufficient copies of the most important textbooks and that the Reserve system did not function adequately. The Head Librarian suggested that faculty were lax in placing books on Reserve, and that undergraduates held on to them too long.

There was much criticism of the Map Room of the Library. Apparently it is not staffed by a cartography specialist, and sometimes not staffed at all. The collection of atlases was said to be out of date.

Computing Resources

The Geography Department has concentrated its investment upon Macintosh PCs although we did notice IBM PC clones in some labs. The user friendliness of the Macintosh is legendary but a modern department must expose its students to the IBM system as well, because of the vastly greater range of professional software that is available on the latter, e.g., modern computer cartography and GIS systems.

Though students at Simon Fraser University do enjoy access to microcomputers for general word processing in the Library and in facilities provided by Computing Services, the undergraduates (and most graduates, we understand) have access within the Department only to the Macintosh Laboratory -- actually, shared with the Department of Linguistics. It is an internal room, but carpeted and quite pleasantly lit. We counted 19 Mac Pluses, one Mac II,

two standard printers and one laser printer. There is space for the addition of up to ten further PCs.

The students were very critical of this facility on two scores:- 1) the software is mostly out of date, and (emphatically) 2) the hours of access are too limited. We understand that the lab is open only between 9:30 am to 4:00 pm, when supervisors are present. This is very restricting. An extension of two hours would probably lessen the undergraduates' problems. The graduates requested number code (push button) locks, with themselves given the code to have access at all hours: this system works adequately at some of our own institutions.

We were informed that the University is disposing of its main frame computer and switching over to a UNIX system. None of the Geography faculty or students expressed any misgivings at this change. There are no very large users (i.e. CRAY-scale) in the Department at the present time.

There appear are no initiatives at this time to resolve these concerns. While the University's computing environment is in the process of switching to a networked system of microcomputers, Geography's access to this system has not been addressed. Professor Poiker has arranged opportunities for SFU students to use facilities and GIS software (the industry standard ARC/INFO) at the British Columbia Institute of Technology, but this does not represent a long-term solution for giving student's at Simon Fraser access to such facilities. The Department is in the process of securing a commercial GIS software package (Terrasoft). While this will provide unlimited use without concern for site licenses, some doubts were expressed about the suitability of this software for more advanced work in GIS.

Use of the University Computing Services teaching lab (more than 100 IBM-386 computers), while suitable for undergraduate teaching, may not be appropriate for the intensive research-oriented uses expected of graduate students. Consideration for developing an in-house computer lab for geography would not be unreasonable -- 15 to 20 terminals operated through a network server, and site licenses to allow use for automated cartography, GIS, spatial analysis, and quantitative methods, would give Simon Fraser the kind of facility already in place in the leading Canadian geography departments. Students, particularly graduate students and students working on senior essays should have access to such a facility in the evenings and on weekends.

The Provision of Office Space Laboratories and Other Special Facilities

All administrators whom we met acknowledged the inadequacy of much of the space that the Geography Department now controls or has available to it as the principal user. The student representatives and most faculty complained about many aspects of it in their private meetings.

There certainly are some grave inadequacies, as indicated below. In addition, a high proportion of the classrooms, labs, etc. are interior (windowless) and walled throughout in unpainted concrete blocks, which is psychologically distressing. We left with the feeling that upgrading and increase of space would make a great difference to the morale of this Department.

Office Space

The administrative offices are beautifully sited, light and airy. Offices of faculty members that we visited were also light and had quite pleasant views. However, a majority of them were only about half the size that we are accustomed to, being too small to house a working book and map collection, a PC, and still leave room for a couple of students to fit in for a chat. We heard of one instance of two full time faculty sharing an office, which is simply not acceptable. The allocation of space to geography faculty conforms (apparently) to the University's formula for the Faculty of Arts. But this does not recognize the special space requirements that geographers have for working with maps on a routine basis. At the University of Western Ontario, the Faculty of Social Science allots 25 percent more space to geographers than to other social scientists.

The graduate students complained there were only 20 desks assigned to them, with the result that many grads "nested" in corners of their supervisors' labs. The latter is common practice in our experience and can be very efficient. The "official" graduate desk space in the Department was crowded, being about one half of that available per student in our own departments.

The Teaching Rooms

The rooms are summarised in the order in which we saw them:-

1. Air photo and cartography lab.

An interior room with 26 student spaces. Old fashioned, equipped at a basic level. It could be converted to a computer cartography room.

2. A general teaching room.

An exterior room with tables, 20-30 seats and housing the geological specimens collection for basic geology classes. A simple, pleasant space, well lit.

3. The professional drafting, map study and equipment store rooms. Problems with this space are mentioned under Adequacy of Support Staff (Section IV). The rooms are interior, terribly crowded, most inadequate for the professional drafting and individual student map work supposed to be undertaken there.

The undergraduates complained that this facility closed at 4:30 pm every day, further limiting them.

4. A larger teaching room.

This was an interior room with 24 tables, thus accommodating 50 students or more. We were informed that it was used for much of the physical geography teaching. It was depressing space.

The Special Laboratories and Other Facilities

1. The Macintosh Laboratory (shared with Linguistics) is summarised under Computing above.

2. The Geomorphology Laboratory.

This is a narrow interior room shared by the two geomorphology specialists. It was housing four of their graduates when we visited. It contained about four metres of bench space, a sink, a tiny fume hood, a balance table, a Sedigraph and storage.

This is very crowded, poorly equipped space. A second lab is listed in the Department Report but we did not visit it.

3. The Climatology Laboratory.

This was an interior room that contained a bench, a sink, storage. There were one or more graduate students "nesting". The room is required for building, repairing and storing field equipment only. Although small and crowded, the climatologist considered himself to be better served than his colleagues, who must also attempt the analysis of samples returned from the field in their labs.

4. The Biography Laboratory.

Another narrow, crowded interior room, with two graduates nesting. It also contained two benches with sinks, a small fume hood, an oven, a refrigerator, an antiquated AA spectrophotometer, sieves, and storage.

5. The GIS/SIS Laboratory.

This is an exterior room with windows set high. It is shared by the two GIS/SIS and photo analysis specialists and houses four of their graduate students. Our visit was too brief to note down all of the working equipment but it appeared to contain sufficient up-to-date computer, optical and display components for three or four workers. It is very crowded for the work of the grads and faculty specialists whom it serves. We were astonished to learn that it is also used to attempt to instruct undergraduate classes. Professor

Poiker informed us that he took his students to the B.C. Institute of Technology to instruct them in ARC/INFO on PCs.

GIS instruction is growing by leaps and bounds in geography departments of all standards on this continent. Soon, graduate schools and professional employers will expect quite advanced GIS competence of all geography students graduating at Major or Honours levels. We are familiar with developments in Ontario and Quebec, where the following pattern is emerging: -- \$150,000 to \$300,000 is being invested to establish GIS labs with ten to twenty work stations, including one or more Sun stations and a SPARC facility. The price includes software. Most labs are opting for ARC/INFO as their GIS system of choice. Universities such as Sherbrooke, Waterloo, and Western have each invested \$1,000,000 or more for teaching and research laboratories in GIS, automated cartography, remote sensing, and quantitative spatial analysis. Institutions are negotiating some very favourable hardware/software package deals with the competing computer companies; it is a buyer's market at the moment.

6. Special field Equipment.

The Department Report (Vol.1) lists a 7 m boat, a 4-wheel drive vehicle, seismic, sonar and electrical resistivity profilers. Dr. M. Roberts has a truck-mounted core drilling rig. We understand that Dr. A. Roberts receives financial assistance from the University to help maintain his private light aeroplane, which is specially adapted to take low altitude photos and other imagery.

It is a pleasure to record that the Simon Fraser Geography Department is exceptionally well equipped for field research in geomorphology and in large scale (low altitude) remote sensing. Elsewhere in Canada it is only those departments that maintain northern field stations (Calgary, Laval, McGill) that are as well or better served with specialised vehicles. It is when the samples or images get back to the labs that the difficulties appear at SFU.

7. Cultural Laboratory.

Although an interior facility, attractive wall displays made this room appear bright. It is an active space, now accommodating map and document analysis associated with the Burnaby Centennial Project. However, only a few people can work in this room at any one time, making it less than desirable as a teaching facility. More table work space and more storage space for maps are needed.

IV. The Adequacy of the Support Staff

The Administrative support staff comprise a Department Assistant, a Chair's secretary, a Graduate secretary and one secretary handling typescript for coursework, general correspondence, etc. The Assistant has a personal office; the secretaries are housed in very pleasant, well lit and airy space and furnished with modern word processors, printers, a copying

machine, etc. It was suggested that one further secretarial appointment was needed, but we would not assign that a high priority. It would be a good idea to buy a FAX machine and rent a second copier.

One of the responsibilities of the Department Assistant is to counsel geography and undergraduates on the programs, and even the specific courses that they should enrol in. This surprised us because in other geography departments this task is generally undertaken by one or more of the faculty. We understand that the Assistant herself does not have academic qualifications in geography.

The Technical staff consists of one Resources manager and two cartographers/ cartographic drafts persons. The manager maintains inventory, stores, issues and handles the Department equipment. He displays a very positive attitude in a difficult situation. His storage facilities are desperately crowded. He informed us that much of the undergraduate teaching equipment, (e.g., survey instruments) was worn out or out of date and in need of replacement.

The two cartographers also struggle to cope with poor space. It is internal (i.e., no daylight; drafts persons should be given day lit space to alleviate eye strain). It is crowded with map storage cabinets. We were astonished to learn that some cartographic and air photo instruction of undergraduates apparently has to take place between them. The space available for professional drafting was ludicrously inadequate. The cartographers themselves should be given professional training in computer cartography and diagram drawing; this is now predominant in the leading geography departments. The cartographers informed us that they were eager to learn.

If the Department is given the equipment and facilities that a modern, PhD-granting geography department truly requires, then there will be a need for a further technical appointment to help the Resources manager. We recommend someone with electronics training.

The staff was unanimous in its strong support of the Department, expressed considerable pleasure in working with faculty and students, and showed pride in affiliation with the University.

V. Research, Teaching, and Service Linkages:

The success of any academic program is conditioned by its connectivity and communication within a broad community of scholars and with the public and private sectors. In this sense, geographers at Simon Fraser share a rich set of linkages. They are involved in several interdisciplinary programs, they participate in contract research for various private and public agencies, maintain

an active colloquia series, and draw students from throughout Canada and from other countries.

Within the University, the Department is carrying its weight. It shares faculty appointments with Women's Studies (Nesmith), and the School of Environment and Resource Management (A. Gill). The department plays a leadership role (A. Roberts and Hickin) in the Institute for Quaternary Research, providing interdisciplinary linkages with scholars in archaeology, physics, biology, chemistry, resources management, including participants from the University of British Columbia and the Geological Survey of Canada. Other geography faculty participate in the Centre for International Studies, Latin American Studies, and in Canadian Studies. One member of the Department now serves as Dean of the Faculty of Arts (Brown), one directs the University Gallery (Gibson), and another is Executive Director of SFU at Harbour Centre (W. Gill).

The Department encourages its students to take courses in other departments, particularly in economics, sociology and anthropology, political science, history, bioscience, chemistry, physics, and mathematics and statistics. Several departments list program requirements or options in geography, for example business administration, gerontology, history, Latin American studies, education, biological sciences, British Columbia studies, Canadian studies, and Chinese studies.

Beyond Simon Fraser University, the Department interacts with community colleges and with other educational institutions in British Columbia. Faculty members are invited frequently to give lectures in other universities and at specialized conferences throughout the world. An excellent example of its academic outreach to the local community is the participation of several faculty in the Vancouver Historical Atlas and the Burnaby Centennial projects.

Internationally, the Department fosters linkages with a sister university in Germany (Saarland). The international research experience of faculty covers the Amazon region (A. Roberts, Lesack), West Bengal (Nesmith), Japan (Nesmith), Europe (Evenden), Thailand and Southeast Asia (Wong), and Latin America (Bromley, Hayes, Lesack). The current group of graduate students include representatives from the United States, Thailand, Zambia, Scotland, China, Bangladesh, and Indonesia.

The Department has recently started a regular Geography Colloquia series, inviting geographers and others to exchange ideas on current research and developments in the discipline. This year's speakers have included prominent geographers such as Michael Dear (Southern California), Patricia McDowell (Oregon), Paul Villeneuve (Laval), and Allan Pred (California-Berkeley). Other forms of disciplinary linkage are achieved through the Department's active participation in scholarly associations and

regular participation in academic and applied conferences.

While the Department's involvement in communication at all levels (discipline, international, community and university) is extensive, we do see some areas for improvement:

1. The budget for the Department's speaker series (\$100 per year) needs at least a ten-fold increase to compare with programs in other universities and to offset the peripheral location relative to other universities in the country. Graduate students, as well as faculty, should be actively involved in the selection and hosting of speakers. This activity should be advertised to geography undergraduate students and to the University at large.

2. The Department should seek to publish more of its major research pieces in the discipline's core journals. Research-oriented faculty have published successfully, in the more specialized multi-disciplinary journals, but have neglected those journals that address the entire discipline. These include, among others, The Canadian Geographer, The Annals of the Association of American Geographers, The Professional Geographer, Area, and the Transactions of the British Institute of Geographers. Regular publication in these journals will enhance the image of Simon Fraser among prospective graduate students, particularly in the areas of human geography.

3. Active participation by faculty and graduate students in regional and national meetings in Canada and the United States is required to maintain a sustained presence in the discipline. Funding for such participation is below par for Canadian universities. A significant number of faculty limit their scientific and scholarly ties to specialized academic and applied organizations. For example, many do not belong to the Canadian Association of Geographers.

4. The Department may seek to promote the value of its courses for several programs that do not now list geography as a recommended option for their students. Obvious linkages include economics, sociology, archaeology, political science, criminology, Native studies, communications (diffusion studies), among others.

VI. The Undergraduate Program:

Geography's undergraduate programs are a source of considerable pride and strength. Following a thorough revision in 1987-88, they compare favourably with other programs across the country. An unusual amount of faculty energy goes into these programs. Students benefit through access to dedicated and

experienced older teachers and to younger members of the faculty. Together, they provide a diversity of offerings, spanning the range of philosophical, technical, and topical interests in the discipline. Students have opportunity to choose among a set of programs--they may major in BA or BSc programs. An Honors degree option allows for a thesis experience (senior essay).

In the BA program, students may choose specialization streams in cultural historical geography, urban geography, regional and resource development, physical geography, and regional studies, and in a technical stream (cartography, remote sensing, and geographical information systems). The Department's strong participation in the Faculty of Arts Co-operative Education Program (work-study) has enhanced the Department's image in the private and public-sectors of British Columbia.

Not surprisingly, the Department attracts many students. Student participation in Geography has increased in recent years:

	March 1986	March 1990
Student enrolments	1354	1902
FTEs	279	416
Majors and Minors	340	498

Geography undergraduates leave Simon Fraser with a solid understanding of the discipline as a whole and with specialized training according to their selection of core courses that relate to the designated specialization streams. Graduates have opportunities to draw on excellent skills for seeking employment or for graduate education. These skills include quantitative analysis, cartography, geographical information systems, remote sensing, basic computer use, and writing. Depending on their specializations, these may be augmented with background in using archival materials, questionnaire development, and field research observation and analysis.

We expect that the trimester system at Simon Fraser makes strong student social cohesion more difficult than in institutions on a two-semester system. Student cohorts do not pass through the system on the same schedule. In addition, participation in the Co-op program results in less opportunity for cohort-consciousness to develop. Nonetheless, geography students at Simon Fraser have an active Geography Club, show strong morale, and have a positive identity with the Department. We were impressed with the ability of student representatives to express their concerns with clarity and vigour.

The Geography Department offers a good selection of special interest courses to interest students in the Arts, Science, and Applied Sciences faculties. Although we could not verify this information, we were told that about 10 percent of all Science

enrolments in the university are in geography courses. It is clear that the Department offers considerable support for programs in both the Faculty of Arts and the Faculty of Science, and it provides a forum for interdisciplinary interests within the University.

While our overall impression of the undergraduate program is positive, we do recommend that the Department consider the following areas of concern:

1. Are there too many undergraduate course offerings? 84 courses are listed in the 1990-91 Calendar. These include 5 practicums, 2 in directed readings, and one for the honors essay. However, the remainder are substantive courses. If the Department is serious about its intention to expand the graduate program, it should look seriously at the number of courses in the upper level of the undergraduate programs. Many of these courses are not offered every year, and some, even those listed as optional core courses for certain specialization streams, are not available when students need them (for example, Regional Planning, Geog 383, and Biogeography, Geog 415, have not been offered in the past two years). Some courses have not been offered for several years. Calendar listings could give students false expectations. We are concerned too that, if the listed courses were offered more regularly, existing faculty might be stretching their expertise at the expense of research productivity and graduate program involvement.

2. It would help students if courses that are not offered on a regular basis be designated as such in the University Calendar.

3. The BA Majors and Honors are required to take two of cartography (Geography 250), methods in spatial analysis (Geography 251), or aerial photo interpretation (Geography 253). Students and several faculty indicated that Methods in Spatial Analysis (quantitative methods), Geography 251, should be required of all geography majors, a practice in keeping with the standards of most geography departments in North America. A background in statistics is basic to the needs of many jobs and of graduate work in geography--we encourage that this course be a mandatory requirement and that it be taught in the Geography Department. The statistical needs for students in geography extend beyond univariate and multivariate statistics and include exposure to spatial statistics for work with distributional patterns that vary over two and three dimensions. It is a standard practice in universities across Canada that such courses be offered within their geography departments. Simon Fraser BSc majors in geography take a required course in the Mathematics and Statistics Department.

4. To accommodate a required course in Methods in Spatial Analysis (Geography 251), the department may consider designating the current requirement for a course in regional geography to optional status. Even though regional geography is required for completion of the BA and BSc degrees, regional courses have not been offered in some years, posing difficulties for students seeking to graduate. Presently, regional courses are offered by sessional appointees. Students indicate that these are exceptionally well-taught courses, but sense a lack of commitment to them by the full-time faculty.

5. The cartography course (Geography 250) should be converted as quickly as possible to a fully automated micro-computer based course. Students who are not trained in this area will be at a distinct disadvantage in competing with students from universities that have already made this change. This will require modernization of the existing cartography lab and acquisition of appropriate equipment. Access to this facility should be available to students in the evening and on weekends.

6. Geography 301 (Geographic Ideas and Methodology) is a desirable mandatory course for Majors in Geography. As a central core course in the program, the Department should seek to have it offered by a full-time faculty member. It is now taught by a sessional appointee.

7. Student counselling is now under the direction of the Departmental Assistant. Although we did not meet this person, we sense that she is respected highly by students, staff, and faculty and is a strong asset to the smooth running of the department. Nonetheless, the faculty should be more heavily involved in student counselling. Areas for possible improvement include the adoption of standardized waiting-list procedures and careful enforcement of pre-requisite course requirements. Because of the high course enrolments and the inability of many students to obtain the courses they need or want, it is particularly important that waiting-list and pre-requisite standards be widely known and adhered to.

8. Student evaluations of Graduate Teaching Assistants should be reviewed by faculty in making TA assignments. Although we were not able to verify their concern, undergraduate representatives indicated considerable variation in the standards of TA teaching across the Department and suggested that the faculty should assert more authority over the training and supervision of TAs.

9. With the increasing importance of the Co-op program, the geography faculty should institute procedures for regular review of the Co-op student work reports. It is important to

assess the relevance of the work experience in satisfying genuine educational objectives. In addition, awareness of Co-op linkages may give the Department leads to possible research and funding opportunities. For example, in the last two years, geography students have been employed with the following organizations:

Northern Land Use Planning District of the Yukon Region, Ministry of Regional Economic Development, Angus Reid & Associates, BC Ministry of Health, Ministry of Environment, Ministry of Energy, Mines and Petroleum Resources, Chilcotin Ulkatcho Kluskus Nations Tribal Council, Tera Planning Consultants, Science World, Ministry of Forests, Department of Indian and Northern Affairs, Burnaby Arts Centre, Metro Group Newspapers, and Energy, Mines and Resources Canada.

10. Because of the serious space problems for teaching and the practice of over-enrolment in most courses, it may be necessary on a temporary basis to spread more of the teaching load to the Summer semester. We realize that this is not an attractive option for faculty who view this as primary research time and who have field research obligations. However, this must be balanced against the cost incurred by students in finding appropriate courses to complete their programs. Is it possible to assess which courses, if offered in the summer, would expedite degree completion? The students we met said that current summer offerings were serving external needs (for example, teachers, practicums for co-op students) but contributed little to the regularly enrolled majors. We stress that more summer courses serve only as a form of crisis management -- this is not a preferred solution for an already over-extended faculty.

11. The most serious concerns expressed by undergraduates (repeated by graduate students) relate to inadequacy of study space, crowded classrooms and lab facilities, not enough equipment, and lack of evening/weekend access to computers and map sets. We elaborate on these problems in the Section III.

12. We encourage the Undergraduate Committee to develop a broader base of communication with undergraduates. Awareness of student concerns was less than we expected.

VII. The Graduate Program:

The Geography Department at Simon Fraser University offers both a master's degree (MA and MSc) and a doctoral degree. A total of 42 students is currently enrolled in the graduate program, 28 at the master's level, and 14 at the doctoral level. This represents a ratio of 1.9 graduate students per tenure track faculty member, which is low by Simon Fraser University-wide standards where 2.5

students per faculty member is the norm.

To obtain the master's degree, students must complete a minimum of (a) two introductory non-credit courses (Introduction to Graduate Studies, Parts I and II), (b) a methods course, and (c) two other courses chosen from the departmental graduate curriculum. They must also complete a thesis which is adjudicated by a supervisory committee consisting of at least two faculty members from within the Department and a person from outside the Department. Doctoral students are not required to complete any specific course requirements. They must, however, pass written and oral qualifying examinations; they must present a proposal colloquium before interested faculty and students; and they must defend a PhD thesis before a committee made up of three faculty members drawn from inside the department, one member from the university at large, and one examiner from outside the university. The department places considerable emphasis on an "apprenticeship" system of individual graduate supervision in which students are expected to work in close cooperation with a supervisor of their choice.

This system of graduate education has been in place in the Department of Geography since the mid-1980s, before which time course requirements were greater, and graduate student research activities were less emphasized. Since the graduate program began in 1966, 91 master's degrees and 31 doctoral degrees have been awarded. Most of the individuals who have obtained doctoral degrees have gone on to good jobs in academia, government, and private consulting.

The graduate program in geography at Simon Fraser is a going concern, and the review committee heard many positive comments from both faculty and students about its overall operation and potential. Virtually everyone we interviewed expressed reservations about the program as it is currently constituted, and everyone believes that the time for a rethinking and restructuring of the program is long overdue. Of course, opinions differ as to how these tasks might be carried out, but the Department as a whole is unreservedly in favour of a combined strategy involving both an expansion in the number of students and a tightening of standards and direction.

The review committee strongly shares these sentiments for both growth and program improvement. However, given the grave inadequacies we see in the physical facilities and other support for research in Geography, it is difficult at this time to give whole-hearted endorsement to an increase in FTE graduate enrolment. Support facilities must be brought up to acceptable standards to allow the benefits of increased graduate numbers to occur. Even without the current ACCESS incentive from the Province of British Columbia, we encourage the University to make the necessary investment.

Whether or not facilities and resource support are enhanced, however, the graduate program in Geography need serious reform. The imperative of reform is all the more urgent since the graduate program in Geography at Simon Fraser is currently overshadowed by a superior program at the University of British Columbia. The program needs to be shaped into a more attractive centre of graduate training, both for its own sake, and to enable it to compete effectively with UBC for high quality students. These remarks apply much more to the human geography side of the Department than they do to the physical, which is comparatively healthy and focused. The younger faculty on the human side feel an especially conspicuous absence of intellectual leadership among some of their older colleagues. Nevertheless, both human and physical geography suffer from a series of basic structural problems and constraints.

1. As we indicate at length elsewhere in this report, the space problem in the Department has now attained crisis proportions. The space available for critical laboratory facilities is extremely limited, and this is a particularly pressing problem for the physical geographers and the SIS group. Graduate student office space is scarce and at any one time up to one quarter of the graduate students have no guaranteed office space. This state of affairs obviously puts a severe restraint on the sorts of interaction and camaraderie that are essential for any successful graduate program. In the absence of any effective resolution of the space problem the possibility of achieving other desirable changes in the program must be moot.

2. Faculty members now concentrate most of their formal teaching at the undergraduate level, and the scheduling of graduate courses is largely casual and ad hoc. In particular, most graduate teaching is done on an overload basis, and faculty receive little credit for such graduate teaching as they may do. Faculty members receive no credit for time spent in graduate supervision. We feel that at least for those faculty members who are active in research, teaching loads should be reallocated on the basis of three undergraduate courses and one graduate course per academic year. We also recommend that definite course load reductions be offered in proportion to the number of graduate students supervised by any person (say, one half-course per master's student and one full course per doctoral student, awarded to the faculty member upon the graduation of each student).

3. As a corollary of the preceding point, but subject to the provision of adequate space and teaching/research resources, an eventual expansion in the number of students enrolled in the graduate program is needed to achieve critical mass in particular sub-disciplines of the field and to ensure that each course offered will have at least a minimal number of

students registered. (Currently, about ten to fifteen MA/MSc students take three or four one-semester courses in their first year; there are very few students to distribute among the optional more specialized courses that could be offered).

4. Levels of fellowship and teaching assistantship support barely suffice for the program as it is currently constituted. In general, master's students are awarded six semesters of financial support, and doctoral students are awarded eight. Much more money needs to be made available for financial support if the suggested expansion of the program is to occur, and the review committee feels that a 25 percent increase is the minimum needed to achieve meaningful results. Some of this no doubt may come from the province's Access Program. Such an expansion would need to be accompanied by much more aggressive recruitment of graduate students on the part of the Department than is now the case, and especially from the better Canadian universities.

5. We were surprised to learn there are no female PhD students in the Department, in contrast to 14 males (Jan. 1991 Graduate Studies Fact Book). Only 1 woman has completed a PhD since March 1985, in contrast to 12 males. The severity of this imbalance warrants a review of graduate student recruitment.

6. The proportion of students holding "prestige" scholarships such as NSERC, SSHRC, CMHC, and Commonwealth is low. Students need more encouragement and help in applying for these awards.

7. Faculty members are allocated \$350 yearly to attend scholarly conferences and meetings. If there is to be a general upgrading of graduate education in Geography at Simon Fraser University, a much more generous allocation of money than this is essential.

In addition to these seven main structural problems and constraints, there is a further major question about the overall operation of the graduate program. We were made particularly aware of the dissatisfaction of many members of the Department with the scope and content of graduate course offerings. In particular, we believe that much can be done to improve the way in which the current mix of course-work and apprenticeship activity is formulated. At the outset, we need to stress that Geography is an extremely broad and heterogeneous discipline with a long and intricate intellectual history, and it is characterized by a wide assortment of competing philosophical claims, theoretical approaches, and points of view. The Department does little by way of formal course-work to initiate graduate students into this complex terrain of ideas, i.e. the broader conceptual bases and history of the discipline. So far as we can tell, it might actually

be possible for students to gain a PhD in Geography at Simon Fraser without actually gaining any sort of understanding or overview of the multifarious debates and cross-currents that have marked and continue to mark the field. This lacuna is unfortunate on two grounds. For one thing, we would claim that any geographer who does not have an effective grasp of the discipline as a whole is to that degree hampered in his or her future professional career. For another thing, graduate research and scholarship are most productively carried out when they are set in the context of a broader rather than a narrower intellectual vision. There are no doubt many ways of dealing with this matter. One way that we would commend to the Department's attention is to produce a collectively-agreed upon graduate course outline dealing with these various questions, and then to have selected teams of faculty members teach the course as a core requirement for all incoming graduate students (at both the master's and the doctoral levels). Such a course would also enhance the Department's ability to ensure overall control of the quality of graduate students passing through the program. In addition, any reform along the lines suggested needs to be associated with a tightening up of the apprenticeship system, with much closer guidance, advice and feedback being offered to students. This should go hand-in-hand with more aggressive grantsmanship on the part of faculty members, and the more active incorporation of graduate students into faculty research projects. All of these problems seem to be more pressing on the human side of the Department than on the physical side, but we believe that both sides of the Department would benefit enormously if changes of the sort suggested were to be put into place.

Currently, the average time to degree for a graduate student in Geography at Simon Fraser University is 12.0 semesters for MA students, 8.7 semesters for MSc students and 20.6 semesters for PhD students. It is not fair, however, to compare Geography with other academic units at Simon Fraser or elsewhere that do not have thesis requirements for the MA and MSc degrees. Evidently, average degree-completion time is now less than it was in the early 1980s. They are still, however, too long (though obviously the problem is much less acute for the MSc than it is with the MA). We believe that the reforms we suggest would actually shorten the time to degree by ensuring a more intense and rigorous engagement of graduate students in their work.

The graduate program in Geography at Simon Fraser University as it stands today has many positive and viable aspects. In general, it has a good faculty, with some though by no means all, actively engaged in high quality research and publication. It has taken on six new young tenure track assistant professors over the last five years, and these have unquestionably brought a new spirit of enthusiasm and intellectual vitality into the Department. The review committee was impressed with the obviously good rapport that exists between graduate students and faculty, and the morale of the students seems to be on balance high. The University as a whole

offers a good range of opportunities for students to improve their skills and knowledge in cognate fields, and there is a wide variety of high quality interdisciplinary programs providing various opportunities for graduate students in Geography.

We would rank the graduate program at SFU relative to other geography graduate programs in English-language universities in Canada below average, possibly 12th of 17 PhD-granting programs. It is certainly not (yet) of the calibre of McMaster, Toronto or UBC. That said, the graduate program has considerable potential, and with the right kind of support from the University, we believe that the program could rapidly become very much better than average. None of the average departments has the exciting potential that Simon Fraser University gains from its bright young faculty appointments.

We realize that the task is difficult and the external constraints enormous, but we urge the University to take very seriously the needs of the program, and to weigh carefully the inevitably negative effects of inaction. Finally, we submit that our suggested changes would be considerably enhanced if there were an increase in the Department's faculty complement, and we suggest in particular that the Department be given the opportunity to search for a senior appointment (Associate level or Professor level) in human geography, one with a proven track-record of research and scholarship. Such an appointment should aim to greatly strengthen graduate teaching in the Department, and to promote a new spirit of intellectual leadership and direction.

VIII. Environmental Teaching and Research Programs at SFU.

The situation appears complicated here, as it is perhaps at all other mid-sized to large universities trying to face their responsibilities and grasp the opportunities in this very complex, interdisciplinary area. At SFU the following parties were made known to us (there are probably others as well):-

(a) the Geography Department; all of the physical geographers and SIS specialists have appropriate expertise to contribute, and so do many of the human geographers (e.g., Dr. Hayes - medical geographer, etc). The essential contribution that geographers can make is unusually large because SFU lacks a geology department.

(b) the School of Environment and Resource Management in Applied Sciences. This was initiated by the geographers, has some F/T geographers on staff and one cross-appointment. We understand that this department is considering development of an undergraduate program, although that may be a long way off. Co-ordination with the Geography Department and within an organised Environmental Studies framework would seem eminently desirable.

(c) undergraduate Minors in Environmental Toxicology (in Biology) and in Environmental Chemistry (in Chemistry). One of us who has a lot to do with groundwater chemistry and environmental isotope studies is aware of the crucial importance of a geographic input to such programs. Without it the field sampling design (in both space and time) is too often erroneous.

(d) the Environmental Sciences Research Institute has been created in the Faculty of Science.

(e) the Task Force established by the Vice-President (Academic).

The Task Force and others at Simon Fraser will be far more aware of the problems and opportunities provided to the University than we are. We suggest that the difficulties of constructing interdisciplinary, interfaculty teaching or research programs can be overcome. Speaking to concerns arising from our own brief, we view it as an opportunity to build a physical Centre of Environmental Studies that might economically furnish the research labs required of expanded programs in physical geography and resource management, plus initiatives of the Environmental Sciences Research Institute. Enlarged, such a centre could also contain good multi purpose labs for advanced level undergraduate programs (e.g., Environmental Chemistry one afternoon, Chemical Characteristics of Soils the next). In such a way costly duplication might be avoided and a core facility provided to all with interests in the environment.

Geomorphology is a strong and important area of earth sciences. In the United States most academic geomorphologists are incorporated in geology departments. In Canada (as in Britain) the large majority are in geography departments. However, on most campuses they will have neighbouring Geology departments whose physical facilities they can use, and some geology faculty who have closely complementary interests.

It is our opinion that the formation of a separate geology department (earth-sciences program) at SFU would be a mistake at this time. The market for geology graduates is weak, there is a very strong department at UBC and a new department of Earth and Ocean Sciences is being created at the University of Victoria. However, administrators should recognise that this leaves the SFU geomorphologists without the important support that most of their colleagues elsewhere will have. This increases their need for good geomorphology and soils labs. The present geomorphology labs are poorer than those enjoyed by most Canadian geomorphologists working in universities that also have geology departments.

IX. Conclusions

The Department of Geography at Simon Fraser University, having come through a difficult period in the 1980s, is poised to make significant gains in productivity and stature in the 1990s. It has an excellent set of undergraduate programs, in need of only minor fine-tuning. However, to achieve its general goals, it must resolve structural problems in its graduate program and identify strong intellectual leadership for its graduate offerings in human geography. For the graduate program, we have recommended the addition of a new core course that treats philosophical issues in the discipline, strengthening the advisory system, the recruitment of high-quality students, and initiatives to shorten degree completion time. We believe that the faculty are committed to bringing these changes to fruition. However, the likelihood of success will improve greatly with essential support from the Faculty of Arts and the University.

There is a sense of confusion in the University's present initiatives concerning environmental studies. It is hoped that the Vice President's Task Force to investigate the University's role in this area will offer a basis for consolidating and unifying these efforts.

The Geography Department is in dire need of more and better space. We are torn between commendation of the faculty for coping with such inadequacy, and condemnation of them for offering majors, honours and graduate degrees with such an inadequate physical base. No other Canadian department known to us that offers PhDs in physical geography and GIS/SIS is as poorly endowed; we have seen them all, except the University of Saskatchewan.

In conversations upon this matter several possibilities were suggested:-

1. expansion within the present building as other departments move out during the next two or three years (i.e. improvement in academic year 1993-94 or later).
2. accommodation in new, specially designed space, perhaps as part of an Environmental Studies building that supports interdisciplinary programs.
3. provision of more adequate research laboratories for physical geography (possibly in the new Faculty of Science space) and GIS/SIS faculty and graduates.

A combination of 1 and 3 may be feasible in the short term. It (or more) is essential if the Simon Fraser department is to offer facilities comparable to those of the other full service (majors, honours, master's, and doctorates) geography departments in Canada today.

The University must address the problems associated with space and equipment with some urgency. To delay basic improvements in the working conditions of faculty, staff, and students could undermine current opportunities for program expansion in Geography. The University has been successful in attracting some of the very best young faculty in Canada. However, continued neglect of infrastructure will make it difficult to retain these individuals in the competitive period that lies ahead. The demand for new faculty in geography has already escalated throughout North America and will intensify over the next decade. We recommend that Simon Fraser University take the necessary steps now to provide an attractive work environment that will enhance the productivity of its Geography Department.


Acknowledgements:

The Geography Review Committee thanks all who added to our understanding of geography at Simon Fraser University. The hospitality of the Vice President Academic, the Dean of Arts, and the Department of Geography provided a supportive environment for the review process. Opportunities to hear from most members of the geography faculty, and from the Department's support staff and students were particularly helpful. Meetings with the Dean of Science, Dean of Graduate Studies, Library personnel, and Director of the Faculty of Arts Co-op program gave us broader perspectives on the University's mission. The external members of the Committee extend special thanks to Patricia Brantingham (the Internal Member) for sharing her insights on the university, to Alison Watt for her organizational efforts and timely communications, and to John Pierce for his commitment to our comfort and transportation. We apologize for any omissions or misinterpretations that accompany our report.

Submitted on 10 April 1991

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Department of Geography Review Report: Response and
Recommendations

July 1991

Preface

Departmental reviews are by their nature critical and complex processes. Their aim is to assess the strengths and weaknesses of departments and to recommend change. The recent review of the Department of Geography is no exception. Drawing upon a large body of prepackaged information (prepared by the Department) and interviews during a three day site visit, the reviewers prepared a systematic and in-depth report. While the University provided broad terms of reference for the reviewers, most of the basis for assessment was framed by their considerable knowledge of the discipline and other departments in North America. (All had participated in a large number of external reviews). The general consensus of the report is clear. The Department of Geography is very good. For example, "for the past 25 years, the Department of Geography at S.F.U. has contributed significantly to the development of geography in Canada". The report goes on to say that the Department is "... poised to make significant gains in productivity and structure in the 1990's". Members of the Department feel that there is potential, over the short to intermediate term, of becoming one of the leading Departments in North America.

While the Department acknowledges the importance of its own role in achieving this potential (through clarification of goals and the creation of an agenda for change), it must be emphasized that the process of improvement is also intricately tied to the level of support and commitment from the University. For example, the report emphasizes that the University "has been successful at attracting some of the very best young faculty in Canada". Over the next decade however the increased demand for new geography faculty across North America will make it very difficult to retain these individuals unless the University takes "the necessary steps now to provide an attractive work environment that will enhance the productivity of its Geography Department".

The following response to the reviewers report concentrates on substantive issues and questions raised in relation to four components of the program: (1) faculty; (2) program design and function; (3) adequacy of resources; and (4) environmental teaching and research.

Faculty

Physical-The physical geographers are a research intensive group that is "viewed highly by the discipline". During the last ten years a number of clearly defined research streams have emerged. The report takes note of the innovative work currently being done by well established faculty such as Bailey, Hickin, Hutchinson and Roberts. New appointments of Lesack and Moore promise to strengthen the research contributions of this group as well as open new avenues of enquiry. A further indication of the quality and recognition of the research of this group is the support received by all members from NSERC. Having said this, the report suggests that there is potential for more joint or collaborative research. While this is a desirable goal and one that is likely to receive more attention in the future (e.g. Hickin, Hutchinson, Moore and M. C. Roberts were recently awarded \$58,000 to undertake joint research on the Fraser Delta.), the present singularity of research efforts is dictated as much by the inertia, nature and source of research funding as it is by the individuals themselves. There is nevertheless considerable unity within this group, derived from considerable overlap in teaching interests, supervision of graduate students, and joint organization of field trips.

The reviewers identified one of the perennial problems confronting a number of geography departments in North America. Although physical geographers are trained in natural and biological sciences, their 'home departments' are often to be found in Arts or Social Science Faculties. This shows the inadequacy of the traditional Arts-Science dichotomy in principle and carries serious practical implications. For example the split frequently leads to underfunding, lack of lab space and potential friction, over resource allocation, with the human side of the discipline. Fortunately at SFU, good working relations have been maintained between the two sides. But there is no question, on the other counts, that the physical geographers are disadvantaged. The situation is compounded by the perceived failure of the Administration to acknowledge the important role geography and geographers play in the teaching and research of science at the University, a point not missed by the reviewers.

Solutions to these problems could come from a variety of quarters. Geography could move to another faculty such as Applied Science or even a new faculty such as Environment or Environmental Studies.

Alternatively, a formula could be devised to guarantee the physical geographers a share of the science operating and capital budgets. This share could be based upon the Department's contribution to the teaching of the B. Sc. program and/or support from NSERC. What must not be tolerated, however, is the existence in the university of two classes of scientists by virtue of an 'accident' of faculty affiliation.

Human- The human geographers represent the largest, and by far the most diverse group within the Department. The reviewers took note of the strong research profiles of a number of 'mid-career' faculty as well as the considerable research promise of a number of new faculty such as Blomley, Brohman, Gill, Hayes and Nesmith. In fact the reviewers suggest that "recent faculty additions could form the nucleus of a strong identity for human geography in the Department".

Not surprisingly in a group of this size and diversity there is difficulty in establishing a clear human geography identity, a fate shared by human geography in general and, other social scientific disciplines. The reviewers suggested nonetheless that the actual leadership for such an identity might come from a relatively young appointment at the associate or even full professor level, if the correct person could be found, or it could emerge from existing faculty with strength being added at more junior levels. The Department considers that these options are not necessarily mutually exclusive. Recent Departmental practice has been to hire junior faculty and this has served the Department very well. Further consideration of the possibilities implied in these options is under discussion in the Department.

Spatial Information Systems (SIS)- SFU was one of the early leaders, through Poiker, in the field of GIS and automated cartography. The arrival of A. Roberts marked an important addition to Geographic Information Systems (GIS) and SIS through his innovative work on airborne remote sensing capabilities with expertise in multi-spectral and digital image processing. Despite this promising start, the reviewers note that the Department has not kept pace, from a teaching perspective, with developments in GIS and SIS generally. This situation can be traced to a variety of factors --changing priorities within the department, insufficient human resources but perhaps most importantly, as the reviewers noted, the dearth of equipment, facilities and

software. SIS is very capital intensive. Like physical geography, SIS has suffered from chronic underfunding.

Research, Teaching and Service Linkages- Geographers at SFU were given high marks for the development of interdisciplinary linkages through participation in other programs and institutions such as Women's Studies, the School of Environment and Resource Management, Institute for Quaternary Research, Environmental Toxicology, Canadian Studies, Latin American Studies, Urban Studies and the Geological Survey of Canada. The reviewers also noted the development of disciplinary linkages through guest lectures in other universities, the Departments own Colloquia Series and international research experience. To further support these linkages, and indeed the profile of the Department, the reviewers recommended that both faculty and graduate students participate in more regional and national meetings, expand membership in professional organizations and publish more research in the discipline's core journals. During 1989-90 no fewer than 24 papers were given at regional and national meetings and 11 papers were published in mainstream geographical journals.

Unless additional monies are made available for travel it is difficult to see how conference participation can be increased. The Department agrees that current budget allocations are "below par for Canadian Universities". The reviewers recommended a "ten-fold increase" in the speakers series budget to match those of other universities and to offset the peripheral location relative to other universities.

Membership in professional organizations can and should be increased. As to the recommendation that faculty should publish more in the core professional journals, this is a desirable goal but one which, for some faculty at least, is plagued by serious obstacles. For example, none of the core journals in geography is regarded as an appropriate vehicle for dissemination of research results by NSERC. On the human side, for those working in the fields of health, GIS, resources and environment, the tremendous growth in the number and quality of journals, with large readerships, has created a highly competitive environment for publishing.

Faculty Complement: The report emphasizes the need to find a replacement for retiring Colin Crampton and to increase faculty size "to address over-enrolment in courses and projected growth in the graduate program".

It is essential that the Department continue (for teaching and research purposes) to have Crampton's expertise in soils, and terrain evaluation. Less clear is the need for a geology sub-speciality, in view of the University's stated intention to initiate an earth-science program. As to the need for additional faculty, the evidence is clear that while since 1984 faculty members have increased by an equivalent of one and a half new positions, the ratio of majors/minors to faculty has increased by almost 50 percent from 16.4 to 23.7. To maintain the 1984 ratio of students to faculty would require increasing faculty size to 29. The report recommended that at least two growth appointments be created, one in SIS and the other in human geography.

As the report suggests, before any final determination can be made of the most suitable area of specialization(s) for these growth positions, the Department needs "to develop a strong consensus on priorities for possible appointments". Strong arguments can be made for new appointments in all three major divisions of expertise. For example human geographers have pointed to the need for additional positions in regional, economic, transportation and environmental health; physical geographers have argued for a geomorphologist and glaciologist; and SIS faculty see a growing demand for positions in automated cartography and GIS. Regardless of the ultimate decisions that are made the Department recognizes the pressing need to continue to address the gender imbalance issue.

Program Design and Function

Undergraduate: The quality of the undergraduate programs was singled out for particular praise in the report. The reviewers found that the programs "are a source of considerable pride and strength", that they "compare favourably with other programs across the country" and that "an unusual amount of faculty energy goes into these programs". The rapid growth in the program (46% increase in majors and minors since 1986) has inevitably placed pressure on the frequency and type of course offerings, the availability of resources for students, and student counselling. It is also clear that following the redesign

of the undergraduate curriculum in 1988, there is a need for fine tuning of the structure and requirements of a small number of core courses. Given these pressures, the reviewers identified twelve areas of concern. For the sake of simplicity these concerns can be reduced to four groups.

1) Number and Frequency of Course Offerings- There is scope in the curriculum to reduce its size (albeit marginally) by deleting some courses and combining others. To reduce false expectations, it might also be possible to indicate in the calendar that some courses can be offered only occasionally. Equally beneficial to the student would be a posted announcement of the Department's intended course offerings for the following year. To ensure that majors are able to gain access to the necessary courses and to limit the problem of 'crowding out' from non-majors, course instructors will have to enforce prerequisites more rigidly. Although it may be possible to expand the number of course offerings in the summer semester, the Department is limited in pursuing this goal because of the field-based research of the physical geographers, and the need to offer what amounts to service courses to teachers. The Department could improve its course planning if information were made available on intended course demand for the following year. This information could be generated through a simple questionnaire administered by the registrar at each preregistration.

2) Required Courses- Unlike other geography programs, the Department has no requirement that B.A. majors and honours take a statistical methods course. (Currently students are required to take one course from a list of three which includes Geog. 251). While pedagogically few would question the need for such a course, the Department is faced with a number of constraints. In the original proposal for modifications to the curriculum in 1987/88, Geog. 251 was to be a required course; but in order to be consistent with the number of required courses in other departments, Geog. 251, along with 250 and 253, became optional minimum requirements. As well the Department would be faced with the need to expand micro computer hardware and software not to mention access to additional space. It is estimated that if Geog. 251 were to become a required course the Department would have to accommodate 90 students per year. The report suggests that to balance the number of required courses (should 251 become required) it may be necessary to reduce the current requirement for a course in regional geography to optional status.

The reviewers make two other suggestions with respect to required courses. They suggested that Geog. 301 be taught by a full-time faculty member instead of an sessional appointee. Reliance on a limited term appointment is a relatively recent phenomenon. If the University makes good its pledge to reduce the number of limited terms in favour of an equivalent increase in tenure track appointments, it should be possible to honour this recommendation. More problematic is the suggestion that Geog. 250 be converted to a fully automated micro-computer course. Some would argue that as the course is presently constituted, students are disadvantaged relative to students in most other universities who have access to state of the art hardware. Others have argued that since much of the course material is conceptual in nature the hardware issue is not critical. Unquestionably some modernization will have to occur. The computer revolution is not something which any credible geography department can afford to ignore. Modernization of the instruction of this course would require not only new equipment but also a faculty member (most likely new) who could concentrate his/her time on the development of this course and related GIS courses.

3) Student Counselling, Evaluations, and Representatives- The reviewers misunderstood the procedure used for student counselling. The D.A. normally refers the student to the appropriate faculty member. Currently Horsfall supervises counselling for the B.A program and Moore and Lesack for the B.Sc. program. One improvement to this process might take the form of having a designated counselling time for students within the Department, a practice which used to be followed but which was abandoned because of difficulty of students meeting scheduled times. Concern was also expressed about the training and supervision of T.A.'s. In the wake of the new TSSU agreement, the Faculty of Arts is moving to a system of closer supervision of and consultation with graduate students. These changes should improve the consistency of instruction by T.A.'s. On another point, it would appear that there is need to strengthen the lines of communication between the Undergraduate Studies Committee (USC) and undergraduate student representatives, although students do have membership on the USC. It might be useful, each semester, to devote an entire USC meeting to address student concerns.

4) Co-operative Education-Geography plays an important role in participating in the co-op program. In summer semester '91, geography students were, percentage-wise, the largest participants in the program. They represent one-quarter of total placements within the Faculty of Arts. The growth of the program

prompted the reviewers to suggest that, "It is important to assess the relevance of the work experience in satisfying genuine educational objectives". Some have proposed that a faculty member be given release time to oversee the placement of students. University of Victoria, for example, has a full-time non-teaching co-op director who also oversees academic relevance. Unless geography were to receive additional faculty this would shift an increased share of teaching duties to sessionals. Over the short term, the Department, through the Undergraduate Studies Committee, could review the academic merits of the program and, prepare an annual report to be discussed at a Departmental meeting.

Graduate- Since the mid-1980's the graduate program has been structured along the lines of an "apprenticeship model". This approach minimizes course work (12 credit hours and 2 non-credit courses) placing emphasis upon active research and the thesis component of the degree. While the program was described as "a going concern", many Departmental members believe, along with the reviewers, that it is time to rethink and restructure the program in such a way as to favour "a combined strategy involving both an expansion in the number of students and a tightening of standards and direction". To reform the program, consideration must be given to what the reviewers refer to as a number of structural problems and constraints. These are outlined below.

1) Space and Size- The quantity and quality of space available for offices and labs has in the words of the reviewers "reached crisis proportions". While recognizing the need to expand the graduate program to provide that all important critical mass for graduate courses and TA work, the reviewers would not give a strong endorsement for such an expansion without a corresponding growth in space and facilities. Increased space and size therefore become a necessary condition to an improvement in the graduate program. (This issue will be dealt with in the next section). The Geography Department nevertheless has embarked upon a program of increasing FTE graduate enrolment. If increased space and size are necessary conditions to improvement in the program what are the sufficient conditions?

2) Graduate Teaching and Supervision- The size and historical importance of the undergraduate program, combined with the relatively small annual intake of graduate students, has limited the credit given for both graduate teaching and graduate supervision. If the graduate program is to achieve the "considerable

potential" it possesses, then more credit will have to be accorded to faculty involvement in the program. The Chair is willing to try, on an experimental basis, granting credit for successful graduate supervision. This in fact would bring the Geography in line with other Departments in the University. Equally important is the need to offer teaching credit for regularly scheduled graduate courses. There is a variety of options that can be pursued here. Consideration might be given to reducing the number of graduate courses in order to concentrate students and teaching effort more effectively. It may also be possible to 'piggy-back' graduate with undergraduate courses.

3) Course Offerings- The reviewers were of the opinion that the Department should not only increase the number of regularly scheduled courses but also increase formal course requirements. One of these requirements should be a course in geographic philosophy and ideas. Before the introduction of the 'apprenticeship model', in the mid-1980's, the Department operated a graduate program much like what the reviewers proposed. The demise of this model was due in part to the relatively small intake of graduate students in relation to the number of formal course requirements. If enrolments increase (along with space) it may indeed be possible to sustain such a model. There is support in the Department for the introduction of an ideas/philosophy course. One option the reviewers recommended, was to collectively produce a graduate course outline which would deal with the important cross-currents and debates in the discipline for human and physical geographers alike. This course would be team taught. Alternatively, the course could be taken only by human geographers and taught by a tenure track faculty member. At the recent Departmental retreat it was proposed that in the fall of '91 the Department will offer such a course on an experimental basis to the human geographers.

4) Financial Support- Currently, graduate students are offered between five (MA/MSc) and eight (PhD) semesters of support. The majority of this support comes from TA-ships. The rest is derived from graduate fellowships (ten per year), research stipends and special entrance scholarships. Individual faculty, of course provide support in exchange for research assistance. The reviewers concluded that the existing level of funding was inadequate particularly if the program is to expand. It was recommended that funding be increased by at least 25 percent. An important argument in support of this recommendation is that, if SFU is to compete with the better known and established institutions, such as UBC, competitive support levels are

imperative. At the same time students themselves have been remiss at securing prestige scholarships from NSERC, SSHRC and CMHC. To address this problem it has been proposed that in Geog. 700/701, students write their research proposals as if they were research grant applications. For those SFU graduands who have received support, the Department has traditionally encouraged them to study elsewhere. The Department is considering a review of this practice. Clearly the onus for expanding support to graduate students must be shared by all parties-faculty, students and the University.

5) Completion Times- Since the late 1980's, the Department has made considerable progress in reducing completion times. Calculation of completion times for MA students for the last four years revealed that the Department's average had fallen from 12 to 10.4 semesters. MSc completion times were already below the University average during the second half of the 1980's. While the completion times for PhD are still above the University average, they are rapidly approaching the norm. It is the opinion of the Graduate Studies Committee that the level of support for graduate students should increase. At the same time the guaranteed period of tenure for these awards should be strictly enforced

6) Gender Balance - The reviewers correctly identified a serious imbalance in the proportion of women in the PhD program. It would appear that while women are increasing their proportion of total undergraduate enrolment, there is less willingness, for whatever reasons, to go on to do graduate research. Of the 108 1991/92 applications for graduate school in Geography, 26 percent were from women. One-third of incoming graduate students however are women. One way of expanding the number of women applicants is to actively recruit potential candidates at regional and national meetings and from our own student body.. Women must be persuaded that a graduate degree in geography is both a viable and worthwhile pursuit.

Adequacy of Resources

The reviewers urged the University to help the Department overcome "what are probably the most severe space and resource constraints on any graduate-level geography department in Canada today". An analysis of these constraints follows along with some recommendations for improving what has been allowed to become an intolerable situation.

Operating and Capital Budgets- The need to redress the serious imbalance in the operating budget is clear and persuasive. The current 1990 budget of \$78,000 is roughly the same, in nominal terms, as in 1982. An increase to \$100,000, as suggested by the reviewers, would not of course bring the Department back to its 1982 level of purchasing power but it would nevertheless be some improvement. It must be emphasized that while many departments are arguing for budget increases, on the basis of the need to catch-up, the Geography Department's request has less to do with offsetting the ravages of inflation as it does with the special equipment and operating needs. The physical geography program has special needs in terms of maintaining and operating costly equipment. The SIS facilities require significant capital resources for updating and to meet rapidly growing instructional needs. On the human side, field trips and field equipment are also important and underfunded. On top of these special requirements the problem of inflation remains.

To place the problem in a comparative perspective, the operating budgets in 1989-90 for chemistry, physics and kinesiology (which are smaller programs than Geography) were \$289,566, \$211,326 and \$113,099 respectively. Moreover the capital equipment allocation of \$25,000 is simply not enough to meet the Department's growing need for software, and computer equipment, not to mention the equipment needs of new faculty in physical geography. A number of these computing and equipment needs is detailed below.

Computing Resources- For undergraduate teaching and graduate research purposes the Department has access to the Macintosh Lab, shared with Linguistics, and the University Computing Services Teaching Lab. Currently the Mac Lab is under tremendous pressure because of too few machines, inadequate software and limited access. With its present emphasis on Mac hardware this facility has only limited usefulness to undergrads and graduate students wishing to do research and applications in GIS and remote sensing. The recent acquisition of two GIS packages (ARC-INFO and Terra-Soft) which are compatible with IBM machines means that all instruction must be scheduled in the East Concourse complex. Even these facilities are inadequate for more advanced applications of GIS requiring more advanced technology. Consequently, a major component of the computer cartography instruction must take place at BCIT- surely a matter of embarrassment for SFU! For these and other reasons the reviewers recommended the development of a GIS

and remote sensing computer lab for intensive research in Geography with 15-20 terminals including work stations and one or more Sun stations and a SPARC facility. This facility would also be useful to teach the revamped and computerized cartography course outlined earlier. More flexible hours and access are also required for the existing Macintosh Lab, implying the need for funds to adequately staff the facility over longer hours.

Office and Lab Space- While the allocation of faculty office space conforms to the formula for the Faculty of Arts, the reviewers pointed out that it does not take into consideration the special space needs of geographers (maps, slide collections, materials for field work etc). If sessional and limited term appointments are included then no fewer than eight faculty must share office space. Space for graduate students is in even shorter supply. Many graduate students have no access to desk space whatsoever. Existing lab space for faculty and graduate students is overcrowded. A number of physical geographers have had to use their labs as office space for graduate students. In the geomorphology lab alone there are four graduate students. The Department's newest faculty member had to agree to become a joint appointment with biology before he could secure lab space. Over the short term these exigencies could be alleviated by restructuring and expanding space into neighbouring areas in the Classroom Complex. The Department has already made a number of proposals in this regard. Over the longer-term, as the reviewers emphasize, new space should be created for geography through the development of an Environmental Studies building.

Support Staff- There are two important areas of redress with respect to support staff. With increasing use of computers for research and teaching, there is a definite need for a technical resources person (such as currently exists in the School of Resource and Environment Management and the Department of Communications) to assist with electronic equipment, computer software and other related duties. The other area of concern is in the drafting and cartography lab. It is only in the last six months that a concerted effort has been made to computerize drafting operations. This is long overdue, but to continue this process it will be necessary to purchase more hardware and software. Unfortunately this must be funded out of an already

over-stretched capital budget which as already emphasized, is insufficient to meet the needs of the physical geographers let alone the rest of the Department

Library-Although the reviewers did not have an opportunity to visit the library, they met with library staff, students and representatives of the Department's Library Committee. The map room was considered to be inadequate in terms of atlas holdings and experienced staff. If this facility were to be moved into the Classroom Complex as has been proposed, it may be possible to better serve geographers and the larger University community. As to the quantity and quality of the library's main holdings it is clear that these holdings are adequate with respect to undergraduate students but marginal for research purposes. A number of points need to be made about the nature of and reasons for these shortcomings:

- the lack of expertise in the library in handling geographic book orders for the geography collection.
- the unwillingness of the university to subscribe to regular geographic research paper series.
- inadequate handling by the library in dealing with Government Publications, especially the buying of important documents and reports from the U.S. and Canadian Government printing offices.
- the almost complete absence of direct ordering of books and monographs from international agencies, e.g., the U.N., the World Bank, the Latin American Development Bank, UNESCO, the WHO, the WMO and the Asian Development Bank.
- the apparent lack of direct ordering of books from such private organizations such as Resources for the Future, the Conservation Foundation, World Watch Institute, the Population Reference Bureau and the Population Council.
- the sale of geography journals without the Department's knowledge
- the proliferation of cheap and donated magazines on the journal shelves.
- the inadequate serial collection for a university that offers a doctorate degree in geography.

Environmental Teaching and Research

Currently, there are 22 courses at the undergraduate level and 10 at the graduate, in both human and physical, which deal directly with resources and the environment. And at least eight faculty have active research programs in these areas. The reviewers saw a number of opportunities therefore for co-operation with other schools, departments and institutes at SFU to develop " a physical Centre Of Environmental Studies that might economically furnish the research labs required of expanded programs in physical geography and resource management, plus initiatives of the Environmental Sciences Research Institute". Clearly the University will have to play a leadership role if an initiative of this kind is ever to see the light of day. Members of the Geography Department are united in their desire to develop and participate, as equal partners, in such an initiative. An added incentive for the University to consider such a development, is that there are no other comparable combinations of expertise within the province.

Conclusions

As an objective and independent assessment , the external review report provides a map (albeit small scale) of the present academic terrain of the Department. As such it can be used to enhance the University's ability to pick and choose the best courses of action to promote positive growth and change within the Department. All members of the Geography Department feel that the results and recommendations from the review provide compelling reasons for active commitment from the University to assist the Department in realizing its considerable potential. If the pursuit of excellence is to be more than a byword and catch phrase, then the University has an unique opportunity, in the recommendations of this report, to assist the Department in the further development of one of the top geography programs in North America.