

SIMON FRASER UNIVERSITY

MEMORANDUM

To: Senate

From: Alison Watt, Director, Secretariat Services

Subject: External Review -
School of Resource and Environmental Management

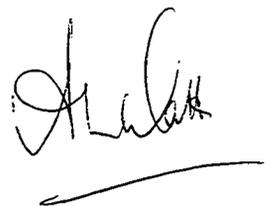
Date: May 21, 1997

For Information

Attached are:

- D. Gagan's observations about the report of the External Reviewers and the School's response.
- the Executive Summary of the report of the School of Resource and Environmental Management External Review Committee,
- the Strategic Plan which outlines the priorities of the School, and

Both the full report of the External Review Committee and the 28 page response prepared by the School of Resource and Environmental Management are available in Secretariat Services for consultation by any Senator. Please contact Bobbie Grant, Senate Assistant at 291-3168 or e-mail bgrant@sfu.ca if you wish to review these materials.



SIMON FRASER UNIVERSITY

Office of the Vice-President, Academic

Memorandum

To: Senate Committee on Academic
Planning

From: David Gagan *David Gagan*
Vice-President, Academic

Re: External Review and Response:
School of Resource and Environmental
Management

Date: April 8, 1997

I have now reviewed the report of the external review committee for the School of Resource and Environmental Management and the School's response. Here are my observations.

1. The External Review

- (a) Generally, the external assessment of the School was very favorable. In particular, the reviewers cited the School's highly marketable MRM graduates, student completion rates, student support, administration, co-operative master's program, GIS initiative, and highly qualified faculty, as evidence of the School's well-deserved national reputation.
- (b) The reviewers nevertheless identified three areas of immediate concern. In their view, space, especially adequate, safe laboratory space, is the School's most serious liability. This problem is closely followed, however, by budgetary shortfalls, and in particular, equipment budgets.
- (c) The external assessors identified several areas in which the School should seek to improve performance. They recommend the creation of an External Advisory Council. They advise the faculty to become more involved with co-op work term evaluations. They recommend that students be given more curriculum exposure to international and aboriginal issues. And the reviewers encourage the School to seek greater interaction with other SFU academic units.
- (d) Finally, the external assessors flagged two program issues which appear to warrant special attention. First, the reviewers expressed concern about the doctoral program, especially the marketability of the program's graduates, the ability of REM's faculty complement to provide adequate supervisory breadth and depth, and the tenuous support packages for doctoral students. They recommend a more specialized doctoral program with limited areas of concentration.

Second, the reviewers addressed the "high degree of uncertainty" surrounding the prospects for launching an undergraduate degree program in resource and environmental management given the current fiscal climate and the inevitable competition with other programs. The assessors argued that this "seems counterproductive in almost every aspect", and expressed a preference for "cooperation rather than competition." (p.6).

2. The School's Response

In addressing the assessors' comments, the School of Resource and Environmental Management has accepted many of the reviewers' recommendations and suggestions and has either taken affirmative action or, as the result of planning retreats, incorporated its response into a formal set of strategic objectives. Most of these reactions require no further elaboration here; but a few deserve to be highlighted. First, the School does not agree that it lacks the "critical mass" to sustain a broadly-defined doctoral program. Secondly, the School continues to believe that if/when resources become available it should pursue its independent undergraduate program in environmental studies both as an end in itself and as a way to enlarge its critical mass of human and fiscal resources for other purposes. Third, the School insists that it must have a dedicated Co-op Program Co-ordinator in view of the administrative demands of this large program. Finally, the school argues that without additional, appropriate space, not only the School's productivity, but its very identity, are in jeopardy.

3. Comments

- (a) In view of the government's moratorium, for the foreseeable future, on new capital projects in the post-secondary system, it is unlikely that the School of REM's space requirements will be addressed through new construction anytime soon. Funding may become available, however, for the rationalization of existing physical plant usage through a variety of new initiatives. In that event, REM should be assigned a high priority for refurbished or reassigned space adequate for its needs.
- (b) Given the likelihood that the fiscal climate in which Simon Fraser University must operate over the next three to five years will continue to deteriorate (or at least not improve), it is essential that the Faculty of Applied Sciences' planning processes address the distribution of the faculty's resources relative to the responsibilities assigned to its constituent schools, and to the outcomes that this investment sustains. For their part, the external reviewers appear to believe that REM is best served by concentrating its limited resources on its highly successful MRM program. I agree with this conclusion. The prospects for implementing another undergraduate environmental studies program that requires additional faculty positions and operating budgets are virtually nil. Providing adequate support for the School's doctoral students would seem to be a difficult problem. In these circumstances the School, in my view at least, should co-operate as fully as possible in one or both of the other undergraduate environmental studies programs, but otherwise focus on its graduate training and research agendas, including limiting the scope of its doctoral program, and enhancing its co-op program.

c. Frank Gobas
Dean Marteniuk
John Stubbs

SIMON FRASER UNIVERSITY
Office of the Registrar
MEMORANDUM

To: SCAP members
From: Alison Watt, Secretary, SCAP
Subject: External Review - School of Resource & Environmental Management
Date: April 30, 1997

Attached is the review of the School of Resource and Environmental Management, and the School's response.

For your information, the members of the External Review Committee were:

Dr. Richard (Dick) Butler (Committee Chair)
Department of Geography, Tourism
and Outdoor Recreation
University of Western Ontario

Dr. Lynn Maguire (member)
Director, Professional Studies
School of the Environment,
Duke University,
Durham, NC

Dr. Bruce Mitchell (member)
Department of Geography
University of Waterloo

Dr. Rolf Mathewes (Internal member)
Department of Biological Sciences
SFU

Executive Summary

- A The current Master's program in Resource and Environmental Management is of high quality and has a strong provincial and national reputation.
- B The graduates of the program are highly marketable and their training and abilities are appreciated by employers.
- C The teaching and research contributions of the faculty are of high standard, with many faculty members being known nationally, and some having international reputations.
- D The School working environment is conducive to the successful achievement of the goals of the program.
- E The overall physical environment is acceptable, but the operations of the School suffer from lack of adequate and sufficient space, and in some instances safety issues need attention.
- F Resources and facilities for teaching and research pose some difficulties and constraints on the operation of the School, particularly in the operating and equipment budgetary areas.
- G Interaction and integration with other units is good in some specific areas but could be expanded in others.
- H Student support, morale, and completion times appear to be acceptable given the constraints existing on the Program.
- I The proposed Doctoral program presents some potential concerns with respect to depth of faculty strength and placing of graduates.

- J The proposed undergraduate program will present some considerable problems to the existing programs and the overall operations of the School, particularly with respect to competition for already stretched faculty resources.

- K Administration of the School is extremely effective, and the support staff are highly motivated, if somewhat heavily worked.

V. STRATEGIC PLAN

Programs:

Goal #1

REM's first and foremost priority is to maintain its graduate programs (i.e. the Masters in Resource Management, Ph.D. in resource management, MRM/MBA programs) at the current level of enrollment (at an average of 80 FTE) and to further improve the quality of the graduate programs.

Requirements:

To achieve this goal, REM does not require an increase in funding or staffing. However, REM does require an addition of student office space and adequate laboratory facilities to create a working and research environment for students and facilities that is comparable to those in other departments at SFU.

Goal #2

REM will be seeking an active role in environmental education at the undergraduate level at SFU. REM is prepared to implement an undergraduate program in REM or to provide courses in support of the Environmental Science and Environmental Studies Programs subject to the availability of funding to cover all costs associated with the increase in its responsibilities. Due to its experience at the graduate level, its excellent relationships with the professional community and its success in placing students in full-time positions in the resource and environmental area, REM believes that it is uniquely positioned in SFU to contribute to undergraduate education in the environmental area.

Requirements:

Requirements for the establishment of an undergraduate program in Resource and Environmental Management has been documented in the BREM proposal, that received academic approval by Senate in April 1996 (check date).

Goal #3

REM intends to further expand its Co-op program and improve the quality of the Co-op experience by providing formal evaluations of student work terms.

Requirements:

Considering that REM has the largest graduate Co-op program at SFU, REM will require part-time funding for a Co-op coordinator to meet its goal of offering an expanded and higher quality Co-op program.

Goal #4

REM intends to develop a Cooperative Resource Management Institute (CRMI) at Simon Fraser University. The proposed Institute will stimulate, encourage, and enhance cooperative research between students and faculty in the School of Resource and Environmental Management and personnel in resource management agencies. The Institute will provide a focal point for frequent interaction between those who are involved with management of natural resources and SFU faculty, graduate students, post-doctoral fellows, and research associates. The Institute will provide REM with an increased critical mass in several areas in resource management. The university will also benefit from greater concentration of expertise in resource management on campus and from new opportunities for multidisciplinary, collaborative university-agency research programs. A proposal for the development of the Cooperative Resource Management Institute is attached.

Requirements:

REM will require office space to house the members of the Institute. Initially, REM will require space for 3 research scientists. If the Institute is successful, an additional 3 spaces will be required in the year 2000. The VP Academic has made a commitment to REM to provide space for the CRMI in the 1997. The Dean of FAS has made a commitment to provide funds for renovation.

Goal #5

To address REM's problem regarding the lack of student space and inadequate laboratory facilities and common room, REM will pursue an active strategy to obtain appropriate facilities. Considering that REM is currently working in insufficient and inadequate space, REM is expected to be at the top of the priority list in terms of infra-structure improvement initiatives at SFU.

Goal #6

REM will pursue the establishment of endowed chair(s) in resource and environmental management to gain additional critical mass in several research areas.

Requirements:

REM will require office and laboratory space to accommodate endowed chairs.

Goal #7

REM will attempt to improve REM's visibility on campus by (i) improving current signs on campus and adding new ones and (ii) adding display cases to publicize its activities.

Goal #8

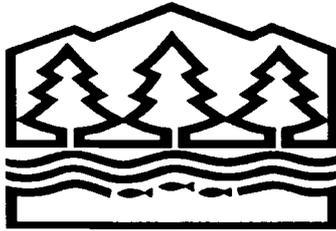
REM will review the operation of the Ph.D. program. One of the goals of this review will to evaluate the process of student admission and supervision. At this time, the issue of intellectual property rights and expectations regarding authorship of publications will be further discussed with the ultimate aim of updating the guidelines of REM on this issue.

Goal #9

To further improve gender and minority distribution in its faculty, REM will review the gender status of its adjunct faculty and will aggressively seek to attract high quality academics and professionals from women and minority groups for adjunct professor positions in REM.

Goal #10

To ensure a highly effective and motivated staff in the future, REM will continue to provide opportunities for training to its staff. REM will further evaluate current procedures for formal annual job and performance reviews.



**School of Resource and
Environmental Management**
SIMON FRASER UNIVERSITY

Memorandum

(FAX: (604) 291-4968 Web Page: <http://www.rem.sfu.ca>)

Date: March 13, 1997

To: David Gagan , Vice-President
Academic

From: Frank Gobas, Director

Phone: 291-3074

Subject: External Review - School of Resource and Environmental Management

The School of Resource and Environmental Management is now able to respond to the Report of the External Review Committee. For your convenience I have attached both a copy of the committee report as well as the school's response to the the committee report. I trust you find the response in order.

Sincerely,

cc: Alison Watt, Director, Secretariat Services
Ron Martenuik, Dean, Applied Science

REPORT OF THE SCHOOL OF RESOURCE AND
ENVIRONMENTAL MANAGEMENT REVIEW COMMITTEE

1995

Committee: R. Butler (chair)
L. Maguire
R. Mathewes
B. Mitchell

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PREAMBLE

The Review Committee (hereinafter referred to as "the committee" or "we") visited Simon Fraser University over three days (September 25-27th, 1995), and during that time met with faculty, staff, students, and alumni of the School of Resource and Environmental Management, and a number of other faculty and senior administrative staff of the University (Appendix 1 provides a list of individuals and groups with whom we met). We would like express our thanks for the very considerable assistance and cooperation which we received from all parties during this period. All of our requests for additional information were promptly and courteously met in full. The discussions which we had were frank and open, but always conducted in a very collegial atmosphere, and it was enjoyable not to be exposed to personal or disciplinary complaints or criticisms. This atmosphere reflects well on both the School and the general University situation.

The structure of the report follows closely the outline of the Terms of Reference of the Review Committee. We have endeavored to address each of the eleven items in those Terms of Reference, and to reflect also the more general concerns noted in the Senate Guidelines for External Reviews of Academic Units, which are also listed in Appendix 2. We have chosen to make general comments on each item, followed by specific recommendations in most cases, and other items for consideration but not necessarily action. We have tried to place our comments and recommendations in the context of the resources currently and likely available to the School and the University in the near future. Overriding this report and much of the planning and future actions of the School and the University is the uncertainty in the province over likely budgets and their effects on the university.

Executive Summary

- A The current Master's program in Resource and Environmental Management is of high quality and has a strong provincial and national reputation.
- B The graduates of the program are highly marketable and their training and abilities are appreciated by employers.
- C The teaching and research contributions of the faculty are of high standard, with many faculty members being known nationally, and some having international reputations.
- D The School working environment is conducive to the successful achievement of the goals of the program.
- E The overall physical environment is acceptable, but the operations of the School suffer from lack of adequate and sufficient space, and in some instances safety issues need attention.
- F Resources and facilities for teaching and research pose some difficulties and constraints on the operation of the School, particularly in the operating and equipment budgetary areas.
- G Interaction and integration with other units is good in some specific areas but could be expanded in others.
- H Student support, morale, and completion times appear to be acceptable given the constraints existing on the Program.
- I The proposed Doctoral program presents some potential concerns with respect to depth of faculty strength and placing of graduates.

J The proposed undergraduate program will present some considerable problems to the existing programs and the overall operations of the School, particularly with respect to competition for already stretched faculty resources.

K Administration of the School is extremely effective, and the support staff are highly motivated, if somewhat heavily worked.

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INTRODUCTION

The Review Committee talked with all full-time faculty members of the School present on campus (together and individually), two faculty members (Gunton and Jacard) not on campus (through telephone conversations), all full-time members of staff of the School, currently registered students in the MRM, MRM/MBA, and Ph.D. programs, alumni of the programs, adjunct professors, employers of graduates of the programs (in person and through telephone interviews), chairs of Biological Sciences, Economics and Geography, Deans of Applied Science, Science, and Graduate Studies, and representatives of the Library and the senior administration of the University. We also had access to a large amount of information on programs, faculty activities, organization and administration of the School, University operations, and students.

In general, the responses and comments which we were given displayed a great deal of consistency and agreement, and there were very few dissenting opinions to the majority consensus on most points. It is clear that there is a generally high opinion of the MRM program throughout the University and the professional community with whom we had contact. Within the School there is justifiable pride in the graduate programs and the activities of faculty, staff and students. There are, however, in both the School and the University at large, concerns and lack of agreement about the high degree of uncertainty which the future holds, particularly with respect to financial matters and new programs. It appears impossible to separate these two items, since the proposed undergraduate program and subsequent changes which will take place in the graduate programs of the School are clearly driven primarily by the anticipated financial readjustments which are likely to have to be made. We are not entirely convinced that there has been as full a discussion and evaluation of the implications of some of these changes as may be necessary, particularly as some of the changes are likely to be irreversible.

Current Graduate Programs

Master's Programs

We believe the existing Master's programs (MRM and MRM/MBA) to be of high quality. Our assessment is based on a number of considerations.

- 1) The quality of students entering the program is very high, based on grade point averages, the national and provincial competitive scholarships which current and past students hold/held, the rigorous screening process of applicants, the number of applicants per place in the program, and their employability on completion or near-completion of their programs. The program is successful in attracting applicants from outside British Columbia, and a small number from outside Canada, despite limited financial support for their period of study. As well, the overwhelming tenor of the comments we heard about the students was positive and supportive.
- 2) The quality of the faculty is high, and nearly all display a high level of commitment to and enthusiasm for the program. There is a good mix of traditional and applied academic skills among the faculty and a considerable range of disciplinary background and skills, although some professions are not currently represented, most noticeably law and engineering. The faculty are well qualified to teach the courses offered, and their involvement in research, both academic and applied, complements the teaching well.
- 3) The program itself, in terms of courses offered, courses required, the nature of course content, and student evaluation procedures is of a high level of academic rigor. Students have to work hard but appear willing to accept this, and morale and esprit de corps are high.
- 4) The Coop element of the program is highly successful in terms of exposing students to the opportunity to work in real-world situation on current problems. Considerable work has been put into this element and it was strongly endorsed by both students and alumni. It undoubtedly helps students improve their employability. Its evaluation procedures would benefit from more formal faculty involvement.

We strongly support the attempts to incorporate training in Geographic Information Systems into the programs. In this day and age it is difficult to envisage any program in resources and environmental management which does not include what has become a crucial tool of analysis in research and planning. We recognize the potential duplication of facilities with other departments, particularly Geography, but are convinced that demand for access to such facilities will more than justify the provision of facilities in each unit. Our experience in other institutions leads us to believe that many other departments and units will ultimately want and need access to such facilities in the future.

The marketability of the graduating students is commendably high, although this presents one minor problem, which relates to students often taking jobs before final completion of their program, particularly their research project, and then taking a considerable time to complete this component once they are in the work force. There is no easy solution to this, beyond maintaining close contact with the student and encouraging employers to pressure them to complete any outstanding requirements. Related to this is the fact that many students do not publish material from their research project once they have left the school, a point of concern to some faculty in as much as publications are necessary for securing additional research funding. The need to review the expectations for the research project and associated publications is discussed in a later section.

In short, we consider the MRM (MRM/MBA) to be of very high quality, with a unique structure and approach. The visibility of the program in British Columbia is extremely high, and most of the graduates enter employment in the province. We feel that one might expect greater numbers of international applications if the program is to claim international status, particularly in view of the welcome absence of a foreign student fee differential.

Ph.D. Program

We have chosen to comment on the Ph.D. program in this section since there are already students in this program. The comments made about the Master's programs with

respect to faculty involvement and courses apply equally to the doctoral program. We recognize the legitimate desire of the School to add a Ph.D. program to a very successful Master's program, and the fact that Ph.D. students would increase the critical mass of researchers in particular fields and complement faculty research and publications.

There are issues about the Ph.D. program, however, which do not apply to the Master's programs. One is the marketability of the Ph.D. students. While graduates of the MRM and MRM/MBA are clearly very marketable in terms of their employment potential, we wonder if the doctoral graduates will find the same success in employment. Employers interviewed were not as receptive to the idea of employing Ph.D. graduates as they were to master's graduates. This may be because they are familiar with the Master's product, but some thought a doctorate would be an over qualification for the current type of employment most common in British Columbia. It is also at least questionable if graduates of the Ph.D. program in REM would be competitive for academic positions in conventional departments. The MRM is certainly a good and accepted program of training for admission to conventional Ph.D. programs, but the higher degree may be less acceptable in the majority of situations.

In addition, the issue of adequate critical mass of faculty in specific areas to supervise Ph.D. students has to be raised. The School of REM has faculty from a variety of backgrounds (compared to a variety of sub disciplines). The School has only one or two faculty in a number of areas, and normally more than this number is considered necessary for a Ph.D. program. While we do consider that the School is capable of instructing and graduating good Ph.D. students, it should consider carefully in which areas it really has suitable faculty advisor numbers and expertise.

Finally, the fact that funding can normally only be guaranteed for two semesters could create problems in attracting Ph.D. students, who will be resident in the program for considerably longer than Master's students and would normally expect a longer period of guaranteed funding.

Conclusion

While our overall assessment of these programs is very positive, there are a number of recommendations and comments for consideration which we feel are appropriate to make. In so doing, we are often reflecting comments and suggestions made during our discussions, and do not mean to imply that some of these points have not already been discussed and considered within REM. The recommendations and consideration points are made at the end of the appropriate sections of the reports, and the recommendations are summarised in Appendix 3, along with suggestions as to who should be responsible for implementation, should they be accepted.

Proposed Undergraduate Program

There is little doubt that the School could offer a successful and valid undergraduate program, and the proposal which we reviewed gives us no cause for concern over the academic suitability of the program. However, it was an initial source of puzzlement to the review committee as to why a School with very successful graduate and research programs should wish to establish an undergraduate program. Discussions revealed that there is certainly concern among many, if not all, of the faculty over the likely impacts of such a program on the established programs and on the effectiveness of the School as a whole.

It is our understanding that the proposed undergraduate program has been promoted primarily because it is seen as the only way to achieve two goals. One basic goal which faculty and others expressed for the School was the need to secure additional teaching assistant funding for graduate students, and another goal was to secure additional faculty members. We agree that both of these matters are legitimate concerns and should be addressed. Undergraduate students would require and be allocated teaching assistantships, which would then provide a source of funding for current and perhaps additional graduate students. An undergraduate program would also legitimize valid claims for additional faculty members to teach in that program. We accept both of these

premises, although we would add the cautionary note that in such times as these with threatened budgets, there is no guarantee that adequate numbers of either teaching assistantships or new faculty members would be forthcoming, even if the undergraduate students arrived. We are not entirely convinced that all alternative avenues of securing additional funds and faculty have been fully explored. We suggest below a number of possibilities which could be explored, although we do so knowing that some of these have already been considered and in some cases shelved because of lack of resources and/or time.

We reviewed the proposed undergraduate program, and discussed this, and the related programs in Science and Geography, with representatives from these units. The original concept for the Environmental Science undergraduate program of a common set of introductory courses and three streams in REM, Geography and Science still seems a sound one. The fact that agreement or consensus could not be reached, has resulted in the three elements going separate ways and introducing three different programs with few common courses, which seems counterproductive in almost every aspect. This seems an issue which may need intervention by senior administrators to ensure that there is cooperation rather than competition between these programs once they are operating.

As noted above, the School, assuming it gains the additional faculty and teaching assistants it would need, is capable of offering an undergraduate program in Environmental Studies from its own perspective, and we would assume that such a program would attract acceptable numbers of applicants, in part because of the reputation of the MRM. The employability of graduates of such a program is likely to be high, although many employers with whom we spoke made it clear that they would not view such graduates as managers, as they do the graduates of the MRM programs. The implications for the graduate programs and the School's overall operations could be severe, however, and we are not convinced that these have been resolved to everyone's satisfaction. One of the strengths of the MRM and MRM/MBA is the great accessibility of faculty to students, and this would inevitably change once faculty were involved with undergraduate courses. A decline in faculty productivity in terms of research publications and involvement with the outside community could also be expected to take place. This

is not just because faculty will be teaching undergraduate classes, but more because of the necessity of meeting with additional students, as well as preparing new courses, arranging additional coop placements and all the other administrative work which goes with an undergraduate program.

We would note also that the principle that new faculty would teach more in the undergraduate program (2 courses) than the graduate programs (1 course), while existing faculty would teach more in the graduate program (2 courses) than undergraduate (1 course), is unlikely to be very acceptable to new faculty once they are established in the School. This proposed allocation of work load is almost guaranteed to create dissension and schisms among existing and new faculty. There also seems little justification for such an allocation based on equity or efficiency considerations. We believe such a proposal is unwise and not defensible.

The undergraduate program would also place considerable strain on staff and the Director, with respect to a great deal more administrative work, including much greater coordination and cooperation with other departments and units than is necessary at present. With current work loads it is difficult to envisage a reasonably sized undergraduate program being handled by the existing staff, unless some other elements of their duties were transferred elsewhere, for example, to faculty, which again would impact negatively on the graduate programs. Finally, as noted elsewhere, additional space is a critical factor, since an undergraduate program and additional faculty and teaching assistants could not be housed in the existing space of the school. There is also no space for any undergraduate laboratory teaching currently available in the School.

We are not saying that an undergraduate program should not be offered, but we are not convinced that all of the implications have been fully discussed and satisfactory arrangements made. It generally proves easier, and is much more common, for units to go from an undergraduate program to graduate ones. We appreciate why this is not the situation in this case, and also that there is pressure in various forms on the School to establish an undergraduate program. "They must have an undergraduate program to carry their share of the freight" was one expression heard in our discussions. An undergraduate program might also provide opportunities for developing additional or stronger links with

other units. Having an undergraduate program would give the School greater weight in discussions over access to resources of various kinds, and, being blunt, would remove the feeling in some quarters of SFU that the faculty in the school are privileged because they do not have to be involved in undergraduate teaching. If the lack of undergraduate teaching is a privilege, and not all would agree with that sentiment, the privilege does not extend to having lighter work loads as far as the School faculty and staff are concerned.

Recommendations

- 1) ~~Discussions should begin again or recommence on the original concept of the Environmental Science program, with the idea of a set of common introductory courses being pursued. Senior SFU officers need to take a lead role to avoid the creation of three programs that could easily end up competing for the same pool of students.~~
- 2) The School should undertake further detailed discussion internally on the specific implications of the proposed undergraduate program and put into place policies and procedures to minimize the impacts on the established programs and operating arrangements.
- 3) The idea of an endowed chair in resources management should be further pursued as an avenue of increasing faculty strength without additional teaching commitments. This could be done with or without the proposed undergraduate program.
- 4) Discussions should begin or continue with the library over the needs of the proposed undergraduate program, as these may be quite considerable and specific.

Points for Consideration

- 1) The School might consider the possibility of increasing fees for the MRM, MRM/MBA and Ph.D. programs and utilizing the funds so gained to employ sessional lecturers to teach in the undergraduate program, if such arrangements are possible.
- 2) The School should consider the possibility of utilizing senior Ph.D. students to teach in the undergraduate program to provide them with the opportunity to teach courses and increase the teaching capacity of the School. If this were to be done, a mentoring arrangement should be established through which Ph.D. candidates with sessional teaching responsibilities would work closely with regular faculty members to discuss pedagogy and other teaching skills.

REM Faculty

The review committee was most favorably impressed by the commitment and efforts of the REM faculty. Most are actively involved in research and in administration, and there is generally a strong esprit de corps amongst members. Given the diverse nature of the backgrounds of the faculty members, there is a good positive working relationship between those we were able to meet. It is fairly clear that the faculty work hard, with supervisory responsibilities, as well as teaching and research expectations. We recognize that, on the other hand, they do not have the general obligations of teaching undergraduate courses for the most part, but we regard their overall work loads as being comparable to those of faculty in other units. At the same time, we do not believe that their work loads are heavier than normal, as some of the REM faculty seem to believe. The review of CVs indicates that the level of success in securing research funding has been high, and the sources of such funding are varied and reflect a good mix of conventional peer reviewed funding and applied research funding that is project driven.

The small number of permanent full-time faculty members in any particular research area presents something of a problem with respect to the Ph.D. program, as noted

below, and to a lesser degree to the Master's programs. We are cognizant of the discussion of upcoming replacement and new appointments, and some differing opinions about the nature of such appointments, and whether they should be "physical" or "social" scientists. It is our opinion that it would be more appropriate and serve the needs of the School better to consider the abilities and research talents and approaches of potential new appointments, and the expertise and skill which they could bring to the programs, rather than make such appointments on the basis of disciplinary backgrounds.

There are some well established and productive links between REM faculty and colleagues in other departments and faculties, most noticeably in the physical sciences, and through joint appointments, as with Geography and Economics. We are not convinced that all possible links have been established that could have been, although we acknowledge that it is easier to make such a comment than to illustrate how the links could be developed. In the final analysis, such links depend very much on the personalities involved, as well as upon timing, budgetary arrangements and administrative attitudes. However, sharing of facilities and sharing of courses can produce benefits to all parties involved, and the nature of REM programs means inevitably that some overlap of material occurs in a number of areas. In the present economic climate every unit and program needs to develop all of the friends and collaborative links that it can, and REM is no exception.

We consider the range of publication outlets which have been used to disseminate the research of faculty and students to be very good, and think it highly appropriate in a School such as this that there is a wide variety of publication formats. In the School there is a great range of different types of research, and a mix of "pure" and "applied" research is not only inevitable but also required. This breadth matches the mission statement of the School and its role in providing a "professional" as well as an "academic" program. (However, we still are unclear what SFU or REM mean by "professional" when referring to programs). We assume, and would urge that appropriate recognition of such activities be given at times of consideration for promotion and tenure of faculty, since it is now becoming normal practice at many institutions to give a wider interpretation to what is accepted as "scholarly activity". The offering of Professional Workshops, for

example, is one way of disseminating research and scholarship which is highly complementary to a professional program. The creativity and scholarship involved in such an activity can be considerable, and allow for good student involvement and participation with clear benefits.

The addition of the Centre for Tourism Policy and Research has given REM an added direction for research and teaching, and one that should yield good dividends in terms of research funding potential, employment and coop placement for students. The Korean project is one example of this. There is a need to clarify the precise role of the Centre within the School, and the relative importance which it should play in terms of student research interests.

We view the practice of allowing some faculty to take extended leaves away from the School as not serving the best interests of the School. While faculty in such a program as REM are often going to be in great demand by the public and private sectors, we, and many we spoke with, consider extended leaves to be damaging to the operations of the School. It is misleading to students who enter the program expecting to work with such faculty, only to find them on leave throughout their program. The practice inevitably weakens the overall effectiveness of the program, however competent the short-term replacements. It also places increased work on the remaining regular full-time faculty with respect to administrative and other duties which cannot be undertaken by short-term or part-time replacements.

While all faculty are involved in programs and administration, it is perhaps inevitable that all loads are not equal. This in itself need not be significant, as different people perform at different levels and in different ways. However, it is common practice in many units to allow junior faculty some relief early in their careers in order for them to develop their research programs and to prepared for promotion and tenure applications. This is difficult in a small unit, and does not appear to have been formally attempted in REM to date, with the result that some junior faculty appear to have excessive loads in administrative and advisory areas. It is not uncommon to find junior faculty with high energy and commitment levels who take on too much for the good of their own career

development, but the Director and the Faculty Dean share responsibility to not take advantage of such enthusiasm.

Recommendations

- 1) The current practice of allowing faculty to have extended leaves of absence should be terminated. This issue was a generally acknowledged problem during our discussions. It can do a program more harm than good to have faculty away from campus and thus normally not involved in teaching and supervision for long (more than 2 years) periods of time.

- 2) Junior, and especially untenured, faculty should receive some formal relief from teaching, supervisory and particularly administrative loads early in their careers to allow them to establish research programs and to prepare for promotion and tenure. In addition, they should receive more guidance and mentoring from senior faculty on what are appropriate levels of commitment and be dissuaded from volunteering for too much activity.
- 3) Faculty should discuss in some detail the precise areas in which Ph.D. students should be accepted, and these areas should be those in which there are adequate numbers of faculty for advisory and examination functions. The appointment of new faculty members should take this issue into account, and when new appointments are considered for the School, emphasis should be given to the specific expertise which individuals could bring to the School rather than whether they are "physical" or "social" scientists, since it is often methodologies and techniques which encourage team work rather than disciplinary backgrounds.
- 4) Faculty members should continue to explore additional linkages with colleagues in other units, in terms of research, in teaching shared or combined courses, and in the use of facilities. Developing a greater number of effective research links with other

departments could also aid the new Ph.D. program in REM. The new GIS facility is likely to be an attraction to faculty and students from other units and may provide a new opportunity for such linkages to develop.

Points for Consideration

- 1) We would encourage the faculty to actively pursue attracting Post-doctoral Fellows to REM. Such individuals can add credibility to programs, as well as providing new blood in research projects and in some cases, could contribute to the teaching in the School.

- 2) On the basis of our discussions we do not consider the disciplinary balance in REM to be a serious issue. We recognize that the gender distribution is lopsided, and that representation of minority groups is poor. However, we are well aware that there is a severe under supply of Canadian women and minority groups in particular available for employment in the area of resources management. The student mix with respect to gender is acceptable, which does leave the issue of role models not fully addressed. We consider this an issue which needs open discussion within the School, but we recognize that there is no easy or obvious way to overcome the faculty imbalance. Deliberate selection of specific adjunct faculty may assist in this issue.
- 3) We suggest that the School ensure that the terms under which workshops, short course and similar activities are undertaken (e.g., for academic reasons, for personal financial gain, for development of the School) be made clear to participants and evaluators of files for promotion and tenure, since the trade-offs in terms of time and effort spent on other forms of scholarly activity are considerable and need to be recognized appropriately.

School Environment, Facilities and Administration

We were favorably impressed with the working environment of the School (we have taken this topic to include items 5, 9, and part of 10 of the terms of reference contained in Appendix 2, since these all relate to one another). There was a very positive attitude of collegiality within the School, and a strong feeling of identity and commitment throughout the faculty, staff and students whom we met, and this was also evident from the comments of alumni. This atmosphere undoubtedly contributes to the success of the program and is the result of many factors, including the leadership shown by the Director. ~~Staff have a considerable level of empowerment and discretion which they seem to use~~ wisely and with faculty approval and appreciation. There is an encouraging sense of collegiality about the operations of the School, although there is some feeling that more detailed discussions need to be held on the proposed undergraduate program and its implications for the overall operation of the School.

The administration of the School was generally widely praised and there was a strong sense of satisfaction with the way in which the current Director has provided leadership. The commitment and approachability of the Director was commented on positively by faculty, staff and students, and similarly by employers and alumni. His efforts over the years explain to a considerable degree the success and reputation of the programs in REM.

The staff of the School seem highly productive and contribute in a major way to the success of the programs, and their efforts seem appreciated by faculty and students, a situation which does not always occur. This may partly explain why job satisfaction appeared to be high among staff. While the School may appear to have an above average staff to faculty/student ratio, the nature of the School and its operations make this ratio appropriate, in the opinion of the review committee. Admission procedures are rigorous and involve a considerable amount of staff work, and the nature of many of the courses and the applied nature of the program itself involve staff in many resulting tasks that might not be present in a more conventional unit.

We strongly support the principle that it is important for opportunities be made available to allow individuals to build on their skills and desire for self-improvement. We think it necessary to allow staff the opportunity to update their skills and to engage in self-improvement, although this can be very difficult in a small unit. Such steps can increase productivity, which can be vital where small numbers of staff are involved. It is also necessary, even in a small and collegial unit, to ensure that expectations and performance match, and may be appropriate to ensure this on a more formal basis than is the case at present. We address these points in recommendations below.

Space is clearly a significant problem and will have to be addressed before an undergraduate program is introduced. ~~The School has inadequate space for its graduate~~ students, approximately half of the appropriate space on a per capita basis (according to SFU guidelines). Laboratory space, although used effectively, is crowded, and in some cases research has had to be adjusted because of these constraints. We recognize that space shortages are all too common in most university situations, but it is clear that in some cases even funded research is being compromised or limited because of problems such as cross-contamination and insufficient facilities. Obviously small units cannot provide all the facilities that the faculty might desire, and the School does rent space and facilities from other units, but for such a productive and research intensive unit it needs more adequate specialized space. Under current conditions, the lack of sufficient and adequate space for sample preparation and similar necessary research support work raises concerns over safety and liability issues, and in our view these need serious consideration and action. If the proposed undergraduate program results in the School gaining additional faculty and graduate students as teaching assistants, then more office space will also be essential.

Although there is a strong sense of community in the School, as we have noted previously, to visitors and other members of the University community, the School is almost physically invisible. Particularly if the School expands its operations with an undergraduate program, it would be beneficial to make its physical presence felt within the building and the University at large. Otherwise some of the distinctiveness and community spirit may be lost.

Recommendations

- 1) The School should be allocated additional laboratory space as soon as possible, in particular, space with a fume hood for chemical operations, and a workroom/laboratory for equipment and sample preparation. As well, the absence of a common room for students to meet in tends to encourage division of the students into narrow research groups simply because the only place they meet is in a laboratory. This is against the spirit of the program which is strongly integrative. A common room would enhance the mission of the School in a practical manner and serve a much more important function than simply a social setting. At the graduate level the opportunity for exchange of ideas between groups and individuals is of paramount importance, and the students in the REM programs appeared outstanding in their willingness and desire to talk to colleagues and peers.
- 2) Staff should be encouraged and allowed time off to take updating programs and courses if they wish, or if it be deemed advisable, to allow them to keep pace with developments in equipment and software for example. We should emphasize that this recommendation does not imply that staff are not up to date, and the fact that they are so efficient is a reflection of their willingness to keep themselves up to date on their own time. This sort of self improvement should be available officially and with formal support, although we accept that it may prove difficult to schedule and finance. However, our experience is that in the not so long run the benefits of such a program easily pay for themselves.
- 3) More formal annual job and performance reviews of staff should take place, to allow adjustments in job descriptions when necessary and to obviate staff members having to request such reviews. While we do not wish to disturb what is obviously a satisfactory and effective operating environment in the School, changes in faculty and staff may alter this situation in the future and staff deserve some more formal expression of satisfaction.

- 4) The School should review the operation of all equipment by faculty, staff and students to assess the safety of such operation. The lack of necessary and appropriate space in our opinion has created some potential safety problems with respect to the operation of equipment. We recognize that in the absence of suitable space operations have to continue, but potentially hazardous situations appear to exist which place faculty, staff, and the university in positions of considerable liability should accidents happen. One example is an electric saw having to be used in an entranceway, and being stored in a seminar room.

Points for Consideration

- 1) The School should consider ways in which to improve its visibility on campus. Profiles are important to success and survival. The School could take steps, perhaps even as simple as more distinctive signs, if these are allowed, to advertise its physical presence in the building. Notice boards which publicize academic and especially applied activities, publications, field research etc. would serve to bring the unit more into the university community's vision and awareness.
- 2) If possible, it would assist staff and probably faculty, if budgets could be clarified as early as possible, to allow longer times for purchase of equipment and related materials. At the same time, we recognize the importance of adaptability and flexibility at this time of budgetary uncertainty and the ability to respond quickly to financial opportunities which may appear.

Progress. Completion Rates and Support of Graduate Students

The rate of completion of students in the program initially appeared to be somewhat slow. However, on comparing completion rates of full time students in the REM programs with the averages for other programs at the university, we find that this is not the case, and despite having a heavy course load, the completion rates by students

in the MRM are satisfactory. The drop out rate or non-completions is also close to, or slightly less than, the university average, and thus is not a cause for serious concern. We did note that it would appear that the employability of the students is a factor which accounts for some of the students not completing their program, as some have taken jobs on completing their course requirements but before they have completed and submitted their research project. In one sense, therefore, the success of the program is creating problems of non-completion, as noted earlier. This may be resolved to some extent by reviewing the nature of the research project requirement.

The requirement of a research project, in place of a thesis, reflects the heavy course component of the programs, and we understand that the project is intended to be less demanding than a thesis. However, there appears to be considerable variation among faculty in their expectations over the amount and nature of work required for this component. Some faculty appear to consider the project to be equivalent to a thesis and spoke in this vein. This is misleading to applicants and would make the Master's programs much closer to three year programs than two year ones for students who were required to make this level of research effort. There is also some variation in faculty expectations over publication of results of the research project, and some apparent confusion over authorship and intellectual property rights of these type of multiple-authored publications.

The Master's programs are heavy in terms of course requirements, even considering that a research project instead of a thesis is required, and yet there was no serious questioning of this work load by either current students or alumni. All agreed that it was a challenging program, yet all seemed to find the load acceptable. All agreed that the preparation which the programs provided was of very high quality, and there were few suggestions for change or improvement. The inclusion of GIS training has already been addressed. There was the feeling that the joint MRM/MBA program would be even more difficult to complete and that the time scale may prove very difficult to adhere to. The only successful graduate to date differed in this interpretation, however, he was also recognized as particularly outstanding by both faculty and students.

Part-time students clearly find it harder to complete their programs in a reasonable time, and this is due to a combination of factors including employment demands, non-availability of release time, absence from the region and inability to attend courses, and personal issues of commitment. There is not a great deal that can be done about this from the point of view of the School, and with limited resources it is unreasonable to expect close contact to be maintained with every part-time student.

Students were particularly supportive of the mix of students in the programs between those coming directly from other programs and those with work experience. They found this mix helpful and stimulating, as too was the mix of academic backgrounds of students. Several expressed the view that it was this range of talents and experience which enabled them to complete the program, as learning from one another was a key feature of the programs and one which seems to work very effectively.

Recommendations

- 1) Faculty should review the expectations for the research project requirement in order to ensure that guidance given to students is consistent with respect to what amount and type of work is appropriate to meet the requirements of this component of the programs. The nature of the expectations for publication of all or part of the research project research should also be discussed and clarified, along with the relative roles of the student and the advisor, and the methods of recognizing contributions through authorship of publications.
- 2) The Coop work term is a valuable feature of the program, but the evaluation of the student work-term report should be done on a more formal basis and not be left entirely to the employer. We consider that if the result is formally recognized and to appear on a transcript, then such reports should be reviewed by faculty on an academic basis to ensure some uniformity and quality control. In most well developed cooperative programs, an accepted principle is that faculty at least share responsibility for evaluating coop work term reports.

- 3) Some consideration needs to be given to clarifying the issue of intellectual property rights and expectations with respect to authorship of publications. While some statements on these matters are made in the Guidelines of the School, (pages 16, and 18-19) more details are necessary in our opinion. Recent publications from AUCC and CAUT may be useful in this regard. Given the importance placed on publication of graduate research by the School, this issue should be addressed as soon as possible.
- 4) The School should continue to ensure a mix of both academic backgrounds of incoming students and between those with work experience and those coming directly from other academic programs.
- 5) The School should monitor closely for the first few years the completion rate of students in the MRMMBA joint program to see if the published timetable is reasonable.

Points for Consideration

- 1) To ensure the continuation of student satisfaction with the programs and to check the suitability of training for employment, the School might wish to explore the introduction of exit surveys of graduating students to formally solicit their opinions of the courses and programs.
- 2) To ensure that students are continuing to make adequate progress in their programs, the School may wish to institute annual diagnostic interviews with students to up date their records on requirements completed and to record formally the state and level of their progress in their program.

University Resources and Linkages

In this section we discuss the current situation of the School, and leave discussion of resources for, and implications of, the proposed undergraduate program to later, as these are separate issues. The School appears to be reasonably, but not generously, treated in terms of budgetary and resource provision. The space constraints have already been commented on. The provision of the GIS facility will fill one major gap, and other computer-related facilities appear adequate, if barely so for the present level of faculty and students. Few, if any units in most universities have the facilities they would wish or need to perform the full range of tasks demanded of them, and the School is no exception to this pattern. We noted, and took as indicative of the commitment of faculty, the utilization of faculty research computer equipment for teaching functions, and the contributions of research funds by faculty to new common School computing facilities in the absence of alternative resources being available.

Library facilities appear adequate for the REM program needs at present, and the relationship between the School and Library appears to be a positive one. It was pointed out that the REM programs are still somewhat disadvantaged in terms of serials and volumes assigned to them because of their late start, and that there is still a relatively small amount of funding given purely to REM programs, in part because of the lack of an undergraduate program. The links with longer established programs such as Economics and Geography help REM needs considerably. The allocation of funds to serials for REM areas is significantly below that for science programs, and an increase in this area, although unlikely given budget constraints, would be of considerable benefit. Changes in library procedures with respect to electronic inter-library searching and loans will aid REM students and faculty in the future. The future Library GIS facility may also benefit the School, and continued liaison between the Library and the School in this area is essential.

We have already commented on the possibility of additional linkages with other units being explored. As outside commentators it is difficult to do more than make this observation since its effective implementation depends on a great many internal and

individual factors about which we could learn relatively little during the site visit. However, we do feel that other individuals and units would be receptive to contacts from REM faculty to develop linkages, both in research and teaching. Formal cross-appointments have some obvious benefits, but also costs, particularly to the individuals involved. Timetable schedules can conflict, loyalties become stretched, and often demands and expectations from units involved in such appointments are greater than the allocated proportion of the individual's time. Nevertheless, cross-appointments can serve units such as the School well, appear to have done so in the past, and are doing so at present.

Recommendation

- 1) The School should maintain strong liaison with the Library, and become more proactive on relevant committees and in providing input into the Library decision-making process with respect to resource allocations. This should also include liaison with external fund-raising sources. In an era of change and cutbacks, it is essential to make sure that the Library is constantly informed about present and future needs of programs and how these are likely to change.

Points for Consideration

- 1) There may be possible benefits from increased linkages in teaching and research with other units, and these should be reviewed both individually and by the School in its entirety. In a time of budgetary uncertainty and reduction, shared facilities and expenses have to be closely examined. Field-based research is essential to the operation of programs such as the MRM, as it is to many other disciplines, and it may be possible to coordinate field research or equipment usage. The expanded sharing of courses has benefits beyond reducing faculty teaching loads. For example, the interaction of different viewpoints was commented on as being one significant benefit of having REM students in other science courses.

Relationship of the School and the Professional Community

Our sampling of the professional community was limited to discussions in person and by telephone with employers of the graduates of the school. On this evidence the relationship of the school to the professional community is excellent. All with whom we spoke praised the quality and training of the graduates of the School and the faculty who had taught them. The students are perceived as being highly employable, very capable in assuming managerial responsibility, and able to fit in and work with a team. On several occasions individuals commented strongly and positively on the breadth of the background of the students and their ability, compared to single-discipline-trained students, to handle complex environmental and resource issues. They were less concerned with whether students could acquire professional certification (e.g. as planners), although this may change as regulations change.

The employers almost unanimously felt that the Master's level was the right one for their needs. However, one must acknowledge some circular logic here, as these individuals had employed Master's students because of their needs. They did feel that undergraduates of such a program might be employable, but not as managers, and Ph.D. less so. A variety of points were made by individuals, naturally reflecting their specific interests. It was pointed out that it would be valuable for students to have primary authorship in one or more publications by graduation to enable them to gain "expert" status, and thus support was given for the idea of publications resulting from the research project. Others praised the courses taken, but some expressed the view that at the graduate level it might be better to place more emphasis on research and less on course work.

A common suggestion was for an increase in international training, through examples studied, through linkages, adjunct professors, in-field training and courses. Another frequent suggestion was for increased exposure to and familiarity with aboriginal issues as these are becoming increasingly important in resource and environmental areas.

All of these comments were made in a positive manner, often with a statement to the effect that they were made to improve an already highly acceptable product. There is

no doubt that among the professional community in British Columbia, the School and its programs have a very high reputation and a very good relationship

Recommendations

- 1) The School should consider the establishment of an External Advisory Committee, which would include representation from the private and public sectors and alumni, to advise the School on potential innovations and changes in programs, funding opportunities and other relevant matters. Such a committee might meet once or twice a year and would provide an opportunity for the School to receive input from those sectors of the community most involved with its operations and its students. Participation would be voluntary and unpaid, but reaction from those in these sectors to whom the idea was proposed during our visit was strongly in favour.
- 2) The School should explore ways to give students greater exposure to international examples and approaches; to aboriginal issues and viewpoints; and to culturally diverse opinions and values. The professional community see these issues as being increasingly important in resource and environmental issues, not only in British Columbia, but elsewhere in North America and the Pacific region. Increasing use of adjuncts and visiting speakers in courses, and twinning and exchanges with other Schools and programs were approaches suggested.

Points for Consideration

- 1) The School should consider introducing refresher or short courses for former graduates and others with comparable qualifications to bring them up-to-date on current research and techniques. These courses could provide a source of revenue to the School as well as furthering its visibility and reputation with the professional community. Care would need to be taken, however, in terms of faculty compensation, either in teaching relief or financial compensation.

- 2) The School should consider ways to further integrate information on Non-Governmental Organizations into student training, as increasingly these groups are playing active roles in resource and environmental decision-making, and providing employment opportunities for graduates.

Review Procedure

In general we feel that the pattern and timetable followed for the review was satisfactory. The timetable was very full, and it seems unlikely that it could have been compressed any more. We considered it very beneficial to have the four reviewers able to conduct the review together at one time. The exchange of ideas, impressions and conclusions between the members of the committee was extremely useful. We make the following comments and suggestions for consideration for future reviews.

It would be helpful for the external reviewers and the internal representative to have a little time together, perhaps even half an hour, before they meet with anyone else. This would allow the group to compare initial reactions to the material which they have received and to agree on the procedure they wish to follow. At the first meeting with senior administrators it would be useful to receive an indication as to what was to be expected of the review committee at the final meeting with the same group.

It was very useful to meet with the group of alumni, employers and adjunct faculty. However, it may have been more useful to have been able to meet with alumni on their own, since they have the advantage of hindsight having gone through the program. Similarly, it may have been useful to have met with Doctoral students separately from Master's students, since some of their concerns are different. This was perhaps less important for the REM programs at this point in time, but as numbers of Ph.D. increase, then the two groups may have more distinct differences of opinions.

We considered the opportunity to meet with employers, both in person and through telephone interviews, to be particularly valuable, and something to be encouraged in other reviews where appropriate. Given the applied nature of the REM programs, marketability of graduates is a major factor, and input from employers is perhaps more pertinent than

for other programs. We found these meetings to be extremely useful and they provided us with a number of new insights. The telephone interviews worked well and proved a viable alternative to trying to meet so many people in person.

Overall, the arrangements which were made for the review were excellent, and the Director and staff of the School were extremely helpful. We would also like to acknowledge the very considerable and thoughtful assistance and arrangements made by Ms. Watt, which made for a smooth and pleasant visit.

APPENDIX 1: Interviews and Meetings

Individuals and Groups with whom the Review Committee met.

REM Faculty

Dr. J.C. Day (Director)
 Dr. A. Gill (joint with Geography)
 Dr. F. Gobas
 Dr. T.I. Gunton (by telephone)
 Dr. M. Jaccard (by telephone)
 Dr. J. Knetsch
 Dr. K. Lertzman
 Dr. R. Newburg
 Dr. R. Peterman
 Dr. M. Roseland
 Dr. P. Wright
 (Dr. P. Williams was on leave and unavailable)

REM Staff

B. Hunter
 R. Keleher
 L. Lee
 J. Runzer

REM Graduate Students: (MRM, MRM/MBA and Ph.D. programs were represented)

REM Alumni: Approximately 10 alumni

REM Adjunct Professors: Five adjunct professors

REM Graduate Employers: Eight employers of REM graduates were interviewed by telephone, representing both the public and private sectors

SFU Faculty

Dr. N. Olewiler (Chair, Economics)
 Dr. J. Pierce (Chair, Geography)
 Dr. M. Smith (Chair, Biological Sciences)

Library Staff: S. Thomas, Head, Collections Management, WAC Bennett Library

Senior Administration and Staff

Dr. D. Gagon (V.P. Academic)
 Dr. B. Clayman (V.P. Research/Dean Graduate Studies)
 Dr. R. Marteniuk (Dean, Applied Health Sciences)
 Dr. C. Jones (Dean, Science)
 A. Watt (Director, Academic Planning Services)

APPENDIX 2: Terms of Reference

All academic units* are reviewed on a periodic basis, normally once every seven years. The purposes of such reviews are to enable units to conduct their own assessments of their strengths and weaknesses, to obtain the views of external experts in the field, and to engage in planning for their own future. The review process is intended to ensure that:

- a) The quality of the program is high and the unit has measures in place to ensure the evaluation and revision of the teaching programs.
- b) ~~The quality of faculty research is high and faculty collaboration and interaction provides a stimulating academic environment.~~
- c) Department members participate in the administration of the unit and take an active role in the dissemination of knowledge.
- d) The departmental environment is conducive to the attainment of the objectives of the department.

*Departments, Faculties, Schools, Programs. Parallel procedures will be used for periodic reviews of academic service units.

Source: Senate Guidelines for External Reviews of Academic Units, December 9, 1993.

APPENDIX 3: Recommendations and Appropriate Responsibility

RECOMMENDATIONS¹

AREA	PRIORITY	RESPONSIBILITY
<u>Proposed Undergraduate Program</u>		
1 Recommencing discussions on common programs	H	Senior SFU Administrators, Faculty in relevant Depts.
2 Implications, policies and procedures to minimize impact	H	REM Faculty and Undergraduate Committee.
<hr/>		
3 Endowed Chair in Resources Management	L	REM Faculty and SFU Development Office.
4 Discussions with Library	M	REM Representative, Library Liaison
<u>REM Faculty</u>		
1 Discontinuation of extended faculty leaves of absence	H	REM Director, Dean of Faculty.
2 Work load reduction for junior faculty in early years	H	REM Director, Faculty, Dean of Faculty.
3 New appointments, areas of interest and skills	M	REM Appointments Committee.
4 Linkages with other areas	M	REM Faculty, Faculty other areas.
<u>School Environment etc.</u>		
1 Provision of additional space	H	Dean of Faculty, SFU Senior Administrators.
2 Opportunities for Staff for self improvement	L	REM Director and Staff Unions/Associations?
3 Formalization of Staff performance review	L	REM Director and Staff Unions/Associations?

- | | | | |
|---|--------------------------------------|---|--|
| 4 | Safety issues of equipment operation | H | REM Faculty and Staff,
SFU Safety Officer?
SFU Administration. |
|---|--------------------------------------|---|--|

Student Progress. Completion etc.

- | | | | |
|---|--|---|---|
| 1 | Expectations of research project report | H | REM Faculty and Graduate Committee. REM Students. |
| 2 | Coop Work Period Evaluation | M | REM Graduate Committee. |
| 3 | Clarification of Publications and Authorship | M | REM Faculty and Graduate Students. |
| 4 | Mix of experience among students | L | REM Admissions Committee. |

- | | | | |
|---|-------------------------------------|---|-----------------------------------|
| 5 | Monitoring MRM/MBA completion rates | L | REM Staff and Graduate Committee. |
|---|-------------------------------------|---|-----------------------------------|

University Resources and Linkages

- | | | | |
|---|-----------------|---|---|
| 1 | Library Liaison | M | REM Representative to Library, Library liaison. |
|---|-----------------|---|---|

School and Professional Community

- | | | | |
|---|-------------------------------------|---|--|
| 1 | External Advisory Committee | M | REM Faculty, alumni, professional contacts. |
| 2 | Increasing diversity in the program | M | REM Graduate Committee, alumni, faculty in other areas, groups off campus. |

¹Priority of Recommendations:

H = Highest Priority; M = Moderate Priority; L = Least Priority

We have based the allocation of priorities on a combination of considerations, including degree of urgency, and whether the item involved is related to correcting "problems", improving the programs, or avoiding potential problems.

*RESPONSE OF
THE SCHOOL OF RESOURCE & ENVIRONMENTAL MANAGEMENT
TO THE
EXTERNAL REPORT OF
THE SCHOOL OF RESOURCE & ENVIRONMENTAL MANAGEMENT
REVIEW COMMITTEE PREAMBLE*

ACKNOWLEDGMENTS

We would like to take this opportunity to thank the review committee for their thorough and thoughtful work. REM believes that the findings in the report reflect a fair assessment of our School's activities and performance. We also like to thank the students, staff, alumni and senior administrators who were involved in the process.

INTRODUCTION

The School of Resource & Environmental Management (REM) was visited by an external review committee over a period of three days from September 25 to 27, 1995. The committee consisted of Dr. R. Butler, Dr. L. Maguire, Dr. R. Mathewes and Dr. B. Mitchell. As part of their review the committee visited with faculty, staff, students and alumni of REM, as well as with members of the senior administration of the University. The committee performed their duties in a highly professional, effective and thorough manner. The committee produced a written review which was received by REM in January of 1996. The report provides a detailed review of the School's activities and performance as well as some constructive ideas and view points. The report was widely distributed in REM, the faculty of Applied Sciences and Simon Fraser University. The findings of the report were discussed in the School's Retreat, which was held in June 1996. The discussion of the report and development of a strategic plan were the only goals of the Retreat. This document summarizes the response of REM to the comments and recommendations outlined in the Review Report. Following the format chosen by the review committee, which is consistent with the original Terms of Reference and the more general concerns noted in the Senate Guidelines for External Reviews of Academic Units, this report will address the items that were discussed in the report. These items include:

- I. Current Programs
- II. REM Faculty
- III. School Environment
- IV. Strategic Plan

I. CURRENT GRADUATE PROGRAMS

Review Committee's Summary Statement:

"The current Master's program in Resource and Environmental Management is of high quality and has a strong provincial and national reputation."

"In short, we consider the MRM (MRM/MBA) to be of very high quality, with a unique structure and approach. The visibility of the program in British Columbia is extremely high, and most of the graduates enter employment in the Province."

Master's Program

The REM and REM/MBA Masters programs are the main programs in REM. Currently they involve 83 FTEs or approximately 90% of our students.

1. We agree that the quality of students entering the program is very high based on grade-point average and the number of national and provincial scholarships that these students hold. Part of the reason for the high quality of REM students is the large demand for the program. For every accepted REM student, there are approximately 10 student applications to the program. REM students come from all parts of Canada. REM has also attracted some students from outside Canada. Foreign students experience severe competition with Canadian students for access to positions in the REM program. This has been the main reason that foreign student intake by REM has traditionally been small.

REM is particularly proud of its ability to attract high quality students despite the limited financial resources that SFU and REM can provide. This further illustrates the high demand for the REM program.

2. We agree with the reviewers that there is a high degree of commitment and enthusiasm among REM faculty for the REM program. Considering the small size of the School (i.e. 9.75 CFL), there is a large range of disciplinary backgrounds among the faculty. However, it is true that not all areas related resource & environmental management are covered. Due to the departure of Dr. Michael M'Gonigle to the University of Victoria, REM does no longer have law expertise in its faculty. However, REM faculty has close contact with the environmental law profession. Practicing lawyers, including Kate Smallwood (Dillon & Associates) and David Boyd (Sierra Legal Defense), have been attracted to REM to act as sessional instructors in the Environmental Law course (REM 646). Student response regarding the Environmental Law offerings in REM have been very positive. Although REM does not have a professional engineer on its faculty, Dr. Frank Gobas is holding a Ph.D. in Chemical

Engineering & Applied Chemistry. His background and research provides students with access to expertise of certain aspects of engineering. The expected hiring of a faculty member in the area of spatial analysis and geographical information systems will help to further broaden the range of backgrounds and skills of REM faculty

3. We agree that the REM program is a very tough program for students. In fact the number of academic credits required by REM (i.e. 73) is more than double that of other masters programs. However, this level of academic rigor is required to educate successful, well-rounded professionals in the area of resource management. The students realize this and are prepared to accept the hard work. As a result, all our 187 graduates, with one exception (i.e. one student is deceased), are currently employed in the natural resource sector, or are pursuing a Ph.D. degree.
4. REM's Co-op program is indeed highly successful. REM's Co-op Program is the largest graduate-student Co-op on campus. Several Co-op positions have resulted in the development of new, non-existing positions in the hosting agency. Despite the success of the REM Co-op Program and the large amount of work and resources that have gone into the development of the Co-op program, REM has been unable to attract any University funding for its Co-op program. Hence, REM does not have a formal Co-op coordinator. REM faculty members and staff are doing the work in terms of finding positions, preparing students, follow-up and work-term evaluations. We agree with the review committee that the Co-op program could benefit from more formal faculty involvement. As a result, we have implemented a policy where the student reports of Co-op program are formally evaluated, discussed with the student and marked. The evaluation will now be reported on the student transcript. Further improvements to the Co-op program can be obtained by providing part-time resources for a Co-op Coordinator. This person can take on the responsibilities for student placement and supervise faculty evaluation of Co-op work terms.
5. We agree with the reviewers about the importance of training opportunities for our students in the area of Geographic Information Systems (GIS). This area had been identified by REM as an area of primary importance. REM has been allocated a faculty position in the area of GIS twice. In both cases, the positions were terminated due to university wide budget cuts and a hiring freeze. Fortunately, REM has been given, for the third time, the go-ahead to hire a faculty member in the area of spatial analysis and GIS. This position is currently being advertised. In addition, REM has obtained funding to develop a high-end research GIS laboratory. The new faculty position and the new GIS lab will guarantee that our students receive up-to-date training in the application of GIS to resource management problems and that students will be able to apply current GIS technology in their research projects.
6. The marketability of REM students is very high. Records of current employment for all of REM's 187 graduates shows that 182 REM graduates are currently employed in the natural resource sector, 4 students are currently enrolled in a Ph.D. program and 1 student is deceased. The high demand for REM students is frequently resulting in a

situation students accept positions in the job market before they have completed the REM degree. This is one of the factors that is causing degree completion times to go beyond the 2 year requirement. It is also causing delays in the publication of research results and it has left REM faculty to carry much of the burden related to the reporting of research results to granting agencies. However, this situation should not be perceived as a problem. First, the students greatly value the excellent employment opportunities that the REM program provides. Secondly, student completion times in REM are comparable to those in other programs at SFU despite the fact that REM students take many more courses than their fellow students in other programs.

Ph.D. Program

The review committee's evaluation about faculty involvement and courses in the Ph.D. program is very positive and reflects earlier statements made regarding the Masters Program.

The committee is questioning the marketability of REM's Ph.D. students based on the response from certain employers. We do not believe that the marketability of our students is a concern for the following reasons: First, in the current job market in the area of resource & environmental management, students from the Ph.D. program will generate their own employment opportunities. The experience of our Master students support this: several master students have started their own businesses. Others have added new expertise to existing companies and agencies. Secondly, the number of graduated Ph.D. students in resource and environmental management will be small (approximately 3 per year, compared to 27 Master students per year), while the demand for these highly skilled individuals is large on a global level. It important to realize that many employment opportunities for Canadian experts in resource and environmental management will lie abroad. Currently, the private sector in the area of resource and environmental management in BC is benefiting from tremendous opportunities in Asia and South America, where there is insufficient expertise in the resource and environmental field while the problems are very large. The availability of Canadian expert knowledge and technology to foreign countries is becoming increasingly significant to the economy of BC and Canada.

The review committee raises REM's critical mass as an issue of concern for its Ph.D. program. It is true that REM faculty (9.75 CFL) is small. The addition of a new faculty member in the near future will help to increase the critical mass, but even with the addition of one new faculty member, it can be argued that there is insufficient critical mass to support the Ph.D. program. We do not believe that this is the case. Regarding the composition of Ph.D. supervisory committees, REM can rely on faculty members from the larger SFU community, which includes the Faculties of Sciences, Arts and Business. Currently, Ph.D. supervisory committees already include non-REM Faculty members. In addition, Ph.D. supervisory committees are now drawn from faculty members from UBC, the University of Victoria, any other possible Universities in Canada; due to the availability

of conference technology,. Also, REM Ph.D. supervisory committees can rely upon input from government scientists and professionals in B.C. (e.g. the Institute for Ocean Sciences, Pacific biological Station).

The issue of long term (e.g. four years) funding for Ph.D. students, while most grants and other research contract rarely go beyond 3 years is indeed an issue of concern with respect to the Ph.D. program. This issue is not unique to REM but applies to many Ph.D. programs on Campus. However, REM faculty members have proven that they can obtain sufficiently high levels of funding to provide students with adequate funding over an extended period of time. Although this does not guarantee funding in the true sense of the word, there is enough confidence among REM students and faculty that a limited number of Ph.D., students can be adequately funded over the duration of the Ph.D. program. Before being admitted to the Ph.D. program students are being informed about the level of funding that they can expect in the Program.

Proposed Undergraduate Program

Although the review committee agrees that REM can offer a successful and valid undergraduate program in resource and environmental management, it questions why REM would be interested in offering such a program while it is performing so strongly at the graduate level. This is a valid question. In its search for answers to this question, the committee identified the need to secure additional faculty and teaching assistants. Although the issues of attracting additional resources for the Masters Program have been brought forward in REM faculty discussion as reasons for developing an undergraduate program, they are not the main reasons. The development of the undergraduate program was initiated in 1990 by Dr. J. Munroe, the Vice President Academic of SFU at the time, in response to a government task force report that identified a lack of opportunities in the Province for university based environmental education at the undergraduate level. REM, on behalf of the FAS, as well the Faculties of Sciences and Arts were asked to develop this undergraduate program. REM supported the development of this program based on a number of reasons. First, (i) it met a need identified by the Province, (ii) the original concept for the program was very good, (iii) it wanted to contribute to the University's goal of establishing the undergraduate program and (iv) it was uniquely positioned to develop a multidisciplinary environmental program because of its experience with the REM Program. Despite the failure to develop a single interdisciplinary undergraduate environmental program at SFU, REM is still supporting the development of an undergraduate program in the area of resource and environmental management because of (i) the demand for professionals in the large natural resource sector, and (ii) the lack of "professional" training programs. Although there are several programs in the general environmental area that have emerged in BC and at SFU, we believe that based on our previous experience, we can offer a program that is (i) of high quality, (ii) provides student with the right skill sets for the job market in the area of resource & environmental management and (iii) has a philosophy and focus that is unique in BC.

REM realizes that the development of an Undergraduate program cannot be realized within the current faculty and staff workloads, departmental resources, space and facilities. As a result, REM has taken the position that it can only develop an undergraduate program when the appropriate level of additional resources, space and facilities is made available.

REM is aware that the development of an undergraduate program will have an impact on the graduate program, even when the resources to develop the undergraduate program are made available. It is possible that these impacts may include less time for graduate students, less accessibility of faculty to students, a decline in faculty productivity and less involvement with the outside community. However, on the other hand, the department will gain in critical mass by adding faculty, gain TA-ships for its graduate students, acquire facilities that can be made accessible to graduate students and gain library resources. REM will also gain influence in the University and take a larger share in the SFU's responsibilities regarding the training of more students.

REM agrees that the principle where new faculty would teach more courses in the undergraduate programs than in the graduate program creates inequities that will result in problems down the road. In its latest proposal, which received academic approval by Senate, REM proposed that all REM faculty share equally in the department's responsibilities at the graduate and undergraduate level.

RESPONSE TO RECOMMENDATIONS

1. Recommendation:

Discussions should begin again or recommence on the original concept of the Environmental Science program, with the idea of a set of common introductory courses pursued. Senior SFU officers need to take a lead role to avoid the creation of three programs that could easily end up competing for the same pool of students.

Response :

On October 9, 1996, in a meeting of the Senate Committee for Academic Planning, REM agreed to work with the Faculties of Science and Arts on a plan that would see REM contributing to the Environmental Science and Environmental Studies program. This is a step towards going back to the original concept of a single Environmental Program at SFU.

2. Recommendation:

The School should undertake further detailed discussion internally on the specific implications of the proposed undergraduate program and put into place policies and

procedures to minimize the impacts on the established programs and operating arrangements.

Response :

REM has discussed the pros and cons of the development of an undergraduate program in REM for the last six years. REM has come to the conclusion that the REM undergraduate program will not only fulfill a societal need for training in resource & environmental management, it will also help to secure and strengthen the graduate programs in the current climate and conditions at SFU.

3. **Recommendation:**

The idea of an endowed chair in resources management should be further pursued as an avenue of increasing faculty strength without additional teaching commitments. This could be done with or without the proposed undergraduate program.

Response:

We agree with the review committee. In the September 1996 faculty meeting, REM has decided to prepare proposals for three endowed chairs in the area of forestry planning. The proposals will be submitted to Forest Renewal BC (FRBC) in their upcoming competition.

4. **Recommendation:**

Discussions should begin or continue with the library over the needs of the proposed undergraduate program, as these may be quite considerable and specific.

Response:

We agree with the review committee that planning for the library resources regarding the undergraduate program is important. Due to the uncertainty for funding of the undergraduate, this planning is somewhat premature. However, REM will continue the planning in a timely fashion.

RESPONSE TO POINTS FOR CONSIDERATION

Consideration:

The School might consider the possibility of increasing fees for the MRM, MRM/MBA and Ph.D. programs and utilizing the funds so gained to employ sessional lecturers to teach in the undergraduate program, if such arrangements are possible.

Response:

Currently, Ministry regulations do not allow universities or university programs to raise tuition fees. REM has considered the possibility of increasing fees for the MRM, MRM/MBA and Ph.D. programs in its June 1994 & June 1996 retreat. It was then decided that raising tuition fees would not be beneficial for the program and the students in the program. There are three reasons for this decision. First, REM invests considerable time and resources to attract the very best students to its program. An increase in tuition fees will provide an extra hurdle for these high quality students and will make the program less competitive relative to programs at other institutions. Secondly, an increase in tuition fees cannot be justified based on greater than average earning power of REM graduates. There is no evidence to indicate that REM graduates will be above average earners, as is the case for graduates of the Business School. Thirdly, an increase in tuition fees cannot be justified in terms of ~~access to space and facilities for students in REM.~~ Currently, space and facilities for REM students are below the university average and there are no signs that space and facilities will become available in the near future.

Consideration:

The School should consider the possibility of utilizing senior Ph.D. students to teach in the undergraduate program to provide them with the opportunity to teach courses and increase the teaching capacity of the School. If this were to be done, a mentoring arrangement should be established through which Ph.D. candidates with sessional teaching responsibilities would work closely with regular faculty members to discuss pedagogy and other teaching skills.

Response

The idea of involving Ph.D. students in teaching at the undergraduate level has considerable merit. However, involving Ph.D. students in teaching should be carried out with great care to ensure that the students have sufficient time to conduct their research. Ph.D. Students in REM will continue to have the option to apply for TA-ships and sessional instruction positions.

III. REM FACULTY

Overall Assessment

The overall assessment of REM faculty and their involvement in research, grantmanship and administration is very positive. We are also pleased that the review committee recognized the strong esprit de corps of REM faculty. The commitment of REM faculty to the REM program has been a crucial factor in the success of the REM program.

Internal Relations & Decision making

Decision making in REM, which includes decisions relating to new faculty hiring, is carried out in the REM Executive Committee. This committee consists of all REM faculty and representatives from REM staff and students. The committee strives to make decisions by consensus and has been successful at doing this. The consensus process leads to the constructive approaches that are referred to in the external reviewer's document. For example, in its most recent July 1996 decision regarding a new faculty appointment, REM decided to search for an individual with skills in spatial analysis and geographical Information Systems. In the advertisement, REM specifies that both "physical" and "social" scientists with these skills can apply. The most talented applicant will be hired, independent of the fact whether the applicant is a "physical" or "social" scientist.

Links with other departments.

REM faculty members have developed many links and good relationships with other Departments. Examples of these relationships are the cross appointments with Geography (Dr. A. Gill) and Economics (Dr. J. Knetsch) as well the appointment of Dr. R. Peterman as an associate member in the Department of Biology. Dr. F. Gobas is a member of the MENTOX Program and is involved in collaborative research projects (e.g. NSERC Strategic Grant with Dr. F. Law) with faculty members in Biology. Dr. A. Harestadt (Biology) is an adjunct professor in REM. Dr. K. Lertzman and Dr. P. Wright are involved in research projects with Dr. M. Schmidt (Geography). Faculty members from other units at SFU are also regularly serving on student supervisory committees of REM students. REM faculty members are serving regularly on supervisory committees of SFU students as well as students at other universities. There are many more examples of productive relationships between REM and other Departments.

In addition to the relationships with other units, REM is also working on arrangements on sharing of facilities and courses with other departments. Recently, REM and Geography have started to work on arrangements for sharing a GIS teaching lab (in Geography) and a GIS research lab (to be built in REM). A member of the Geography department (Dr. M. Schmidt) is involved on the REM committee that is in charge of developing the GIS research facility in REM. Several REM students are taking graduate courses in Geography, Biology and other departments in SFU. At the same time, students from

Geography, Biology, Chemistry, Economics and other departments have been taking courses in REM.

Faculty Workloads

The external review committee found that faculty workloads in REM are comparable to those of faculty in other departments, including departments with an undergraduate program. REM agrees with this statement although it should be recognized that the students supervisory load of a REM faculty member at an average of 10 graduate students per year is much greater than those in other departments at SFU. The greater supervisory load is associated with greater efforts involved in securing student funding and reporting to granting agencies. In addition, due to the small size of the department, the administrative load of REM faculty members is greater than those of faculty members in other departments.

In its report, the review committee has noted that REM is working in a climate where the workload of REM faculty members is continuously being questioned by some individuals. REM agrees with the review committee that statements pertaining to the perceived "light" workload of REM faculty are unfounded.

Professional Program

REM refers to its program as a "professional" program because it provides to students skills and practical experience in critical thinking & analysis, problem solving (individual and team), research, and how to work in an interdisciplinary environment, along with other skills that are required in the private and public sectors. Although some of these skills are also being covered in "traditional" programs, REM's "professional" program strives to be responsive to the needs of the workplace, in which our graduates will be working. Students receive courses in group process skills, conflict resolution, disciplinary integration, institutional behaviour, as well as a set of interdisciplinary courses, including the natural, social and management sciences. The focus of REM program courses is to reproduce the environment that students will find themselves in when they are involved as professionals in the natural resource and environmental management sector.

Extended Leaves

REM agrees that the extended leaves of some of its faculty members have had a negative impact on the program. These effects of extended leaves includes a lack of continuity in student supervision in some areas in REM, a large number of courses being taught by sessional instructors instead of REM faculty members and a number of courses being taught at the downtown campus rather than at the Burnaby Mountain campus, where most of our students reside. However, it is also important to realize that the on-leave faculty members have gained valuable practical experiences which will become an asset for the program in the future.

Junior faculty

Due to the small size of the REM Program and extended leaves given to several faculty members, REM's junior faculty members have indeed carried an excessive administrative and supervisory load. It is important for the senior administration as well as the REM faculty to recognize this and to consider this in future tenure, promotion and merit evaluations as well as the allocation of future workloads.

RESPONSE TO RECOMMENDATIONS

Recommendation:

The current practice of allowing faculty to have extended leaves of absence should be terminated. This issue was a generally acknowledged problem during our discussions. It can do a program more harm than good to have faculty away from campus and thus normally not involved in teaching and supervision for long (more than 2 years) periods of time.

Response:

REM faculty have agreed that extended leaves beyond one year will only be granted in exceptional cases. Extended leaves beyond 4 years will not be granted.

Recommendation:

Junior, and especially untenured, faculty should receive some formal relief from teaching, supervisory and particularly administrative loads early in their careers to allow them to establish research programs and to prepare for promotion and tenure. In addition, they should receive more guidance and mentoring from senior faculty on what are appropriate levels of commitment and be dissuaded from volunteering for too much activity.

Response:

SFU's most recent draft of the Faculty Workload & Responsibilities Policy states that junior faculty can be assigned a reduced workload in their first year to develop a research and a teaching program. REM will implement this policy for junior starting faculty. The Director of the REM Program will ensure that junior faculty members will receive an appropriate work load.

Recommendation:

Faculty should discuss in some detail the precise areas in which Ph.D. students should be accepted, and these areas should be those in which there are adequate numbers of faculty

for advisory and examination functions. The appointment of new faculty members should take this issue into account, and when new appointments are considered for the School, emphasis should be given to the specific expertise which individuals could bring to the School rather than whether they are "physical" or "social" scientists, since it is often methodologies and techniques which encourage team work rather than disciplinary backgrounds.

Response:

REM will review its Ph.D. Program during its next retreat (June 1997). At that time, it will discuss the criteria required for admitting students into the Ph.D. program. An important criterion will be the ability to form strong supervisory committees that involve REM and non-REM members. Directions for new faculty hiring will then be discussed as well.

In its most recent July 1996 decision regarding a new faculty appointment, REM decided to search for an individual with skills in spatial analysis and geographical Information Systems. In the advertisement, REM specifies that both "physical" and "social" scientists with these skills can apply. The most talented applicant will be hired, independent of the fact whether the applicant is a "physical" or "social" scientist.

Recommendation:

Faculty members should continue to explore additional linkages with colleagues in other units, in terms of research, in teaching shared or combined courses, and in the use of facilities. Developing a greater number of effective research links with other departments could also aid the new Ph.D. program in REM.

Response:

REM's Masters and Ph.D. programs have benefited greatly from good relationships with other departments at SFU. As discussed earlier, many supervisory committees of REM students, including Ph.D. students, include faculty from other units in SFU, UBC and other universities, companies and government agencies. REM will continue to explore existing and new linkages with colleagues.

REM and Geography are working on arrangements for sharing a GIS teaching lab (in Geography) and a GIS research lab (to be built in REM). A member of the Geography department (Dr. M. Schmidt) is involved on the REM committee that is in charge of developing the GIS research facility in REM.

POINTS FOR CONSIDERATION

Consideration:

We would encourage the faculty to actively pursue attracting Post-doctoral Fellows to REM. Such individuals can add credibility to programs, as well as providing new blood in research projects and in some cases, could contribute to the teaching in the School.

Response:

We agree that Post-Doctoral Fellows can add credibility to the REM program and provide new blood in research projects. REM has attracted several post-doctoral fellows in the past. However, lack of space and access to good laboratory facilities have shown to be significant problems in attracting PDFs to REM. REM does not have enough space for its graduate students and access to adequate research facilities is limited.

Consideration:

On the basis of our discussions we do not consider the disciplinary balance in REM to be a serious issue. We recognize that the gender distribution is lopsided, and that representation of minority groups is poor. However, we are well aware that there is a severe under supply of Canadian women and minority groups in particular available for employment in the area of resources management. The student mix with respect to gender is acceptable, which does leave the issue of role models not fully addressed. We consider this an issue which needs open discussion within the School, but we recognize that there is no easy or obvious way to overcome the faculty imbalance. Deliberate selection of specific adjunct faculty may assist in this issue.

Response:

With the recent hiring of Dr. Evelyn Pinkerton, REM has improved the gender distribution of its faculty. REM has now three female professors on faculty. The review committee's suggestion to attract specific adjunct faculty is good one and REM will pursue this suggestion in the future.

Consideration:

We suggest that the School ensure that the terms under which workshops, short course and similar activities are undertaken (e.g. for academic reasons, for personal financial gain, for development of the School) be made clear to participants and evaluators of files for promotion and tenure, since the trade-off in terms of time and effort spent on other forms of scholarly activity are considerable and need to be recognized appropriately.

Response:

SFU's most recent draft document of the Faculty Workload Policy does not specifically recognize professional activities. REM realizes that professional activities such as workshops, short courses and similar activities are very important for the development of a successful "professional" program in REM. On the other hand, there is danger that too large an involvement of REM faculty in these activities will have a negative impact on the REM program. It is important to balance the merits and negative impacts of professional activities and to ensure that the professional activities of one faculty member will not result in an increased burden for another faculty member. In absence of recognition of professional activities in SFU's Draft Faculty Workload Policy, REM is considering a Policy where REM faculty members can "buy-out" a maximum of one course to be involved in professional activities.

IV. SCHOOL ENVIRONMENT

Inter-personal

We agree with the review committee that relationships between faculty, students, staff and director have been excellent throughout the entire history of the School. The high level of commitment on behalf of everyone within the Program has created an excellent atmosphere in the School.

Space

We agree with the review committee that "REM has inadequate space for its graduate students". REM has also less space per graduate student than other Schools and Departments on campus.

We also agree that "laboratory space, although used effectively, is crowded, and that in some cases research had to be adjusted because of these constraints".

Inadequate and insufficient space is the largest problem in REM. REM faculty members have been successful in attracting very large amounts of outside funding for research from a variety of sources. However, the proper facilities for conducting research are not available. REM is located in a class room complex, that has no proper laboratory facilities. It is essential that this problem is immediately addressed through the construction of a new building or the redistribution of existing space and facilities. It is especially important because the laboratory facilities are mostly being used by young faculty members, who are at the beginning of their career and will stand to benefit considerably from access to appropriate facilities. Unfortunately, REM itself can do little to obtain appropriate facilities. This requires the attention of the senior administration.

Visibility

We agree that the visibility of the REM program in the University is inadequate. There are several reasons for this. First, REM does not have a front office because of a lack of space. Secondly, REM's space is spread out over the class room building. Thirdly, REM occupies little space on campus. Fourth, REM has made several attempts to have its full name rather than its acronym "REM" included on signs within the University. These requests have been ignored because of the length the name.

RECOMMENDATIONS

Recommendation:

The School should be allocated additional laboratory space as soon as possible, in particular, space with a fume hood for chemical operations, and a workroom/laboratory

for equipment and sample preparation. As well, the absence of a common room for students to meet in tends to encourage division of the students into narrow research groups simply because the only place they meet is in a laboratory. This is against the spirit of the program which is strongly integrative. A common room would enhance the mission of the School in a practical manner and serve a much more important function than simply a social setting. At the graduate level the opportunity for exchange of ideas between groups and individuals is of paramount importance, and students in the REM programs appeared outstanding in their willingness and desire to talk to colleagues and peers.

Response

REM agrees that REM should be allocated additional laboratory space as soon as possible, in particular, space with a fume hood for chemical operations, and a workroom/laboratory for equipment and sample preparation. However, REM cannot take action on this issue. It has informed the senior administration of its space problems on numerous occasions.

REM does have a small common room (approximately 1.5 offices), where students meet and interact. In addition to its function as a place for students to meet, the common room is used to store student mail boxes and materials required for student course work. The common room is too small for most smaller social functions such as birthday celebrations, discussions after seminars, celebrations after a thesis defence etc. In many cases, there is insufficient space for a group of 10 students and faculty to meet. The students end up in the halls and often leave or move to the labs where there is more space. The size of the common room is an impediment for better interactions among students. A proper common room will help to achieve the mission of the School.

Recommendation:

Staff should be encouraged and allowed time off to take updating programs and courses if they wish, or if it be deemed advisable, to allow them to keep pace with developments in equipment and software for example. We should emphasize that this recommendation does not imply that staff are not up to date, and the fact that they are so efficient is a reflection of their willingness to keep themselves up to date on their own time. This sort of improvement should be available officially and with formal support, although we accept that it may prove difficult to schedule and finance. However, our experience is that in the not so long run the benefits of such a program easily pay for themselves.

Response

Staff in REM have had opportunities to participate in courses and updating programs. REM is committed to continue this. As the review committee noticed, REM has a small but highly efficient and motivated staff.

Recommendation:

More formal annual job and performance reviews of staff should take place, to allow adjustments in job descriptions when necessary and to obviate staff members having to request such reviews. While we do not wish to disturb what is obviously a satisfactory and effective operating environment in the School, changes in faculty and staff may alter this situation in the future and staff deserve some more formal expression of satisfaction.

Response :

REM will evaluate current procedures for formal annual job and performance reviews with REM staff. The Director will be responsible for meeting with the staff to discuss this as soon as possible.

Recommendation:

The School should review the operation of all equipment by faculty, staff and students to assess the safety of such operation. The lack of necessary and appropriate space in our opinion has created some potential safety problems with respect to the operation of equipment. We recognize that in the absence of suitable space operations have to continue, but potentially hazardous situations appear to exist which place faculty, staff, and the university in positions of considerable liability should accidents happen. One example is an electric saw having to be used in an entranceway, and being stored in a seminar room.

Response:

The School has reviewed the operation of some equipment by faculty, staff and students. The operation of sawing and sanding equipment in the entranceway has been terminated because of safety considerations. Operations in the Chemistry lab were found to meet safety standards.

POINTS FOR CONSIDERATION

Consideration:

The School should consider ways in which to improve its visibility on campus. Profiles are important to success and survival. The School could take steps, perhaps even as simple as more distinctive signs, if these are allowed, to advertise its physical presence in the building. Notice boards which publicize academic and especially applied activities, publications, field research etc. would serve to bring the unit more into the university community's vision and awareness.

Response:

REM will attempt to improve REM's visibility on campus by improving current signs on campus and adding new ones. REM will consider to add display cases to publicize its activities.

Progress, completion rates & support of graduate students.

Despite the facts that REM students take a much larger number of courses than other graduate students at SFU and in most cases find full time employment before they graduate, degree completion times are comparable to those in other departments of SFU. In general, students accept the high workload, realizing the quality of education that they are receiving as well as the improved employment opportunities. It is true that there is some disparity in the expectations over the amount and nature of work required for the research project despite the fact that REM has clearly defined the expectations for its research project. Given that REM research projects include a large range of disciplines covering the natural and social sciences, this is not surprising. Differences in research methodologies among the different disciplines are one of the main reasons for differences in the amount and nature of the work required to fulfill the requirements of a research project. REM does not agree that these differences in expectations are "misleading" to applicants. In most cases students are aware of the research requirements in various disciplines and realize that they have to meet these requirements.

RECOMMENDATIONS

Recommendation:

Faculty should review the expectations for the research project requirement in order to ensure that guidance given to students is consistent with respect to what amount and type of work is appropriate to meet the requirements of this component of the programs. The nature of the expectations for publication of all or part of the research project should also be discussed and clarified, along with the relative roles of the student and the advisor, and the methods of recognizing contributions through authorship of publications.

Response:

REM has reviewed the expectations for the research project on several occasions. The most recent review was in June 1994. At that time the definition for the research project was updated to address the concern regarding differences in expectations. Guidelines regarding authorship of publications have been established by REM and are documented in the School's Guidelines. Expectations for publication of student research projects was discussed in the June 1996 Retreat. At that point, no changes to the general guidelines were made. Further discussion on this issue is planned for the 1997 Retreat when the Ph.D. program will be reviewed.

Recommendation:

The Co-op work term is a valuable feature of the program, but the evaluation of the student work-term report should be done on a more formal basis and not be left entirely to the employer. We consider that if the result is formally recognized and to appear on a transcript, then such reports should be reviewed by faculty on an academic basis to ensure some uniformity and quality control. In most well developed cooperative programs, an accepted principles is that faculty at least share responsibility for evaluating coop work term reports.

Response:

We agree with the review committee and REM has agreed to formally evaluate student work term reports. The results of the evaluations will be formally recognized on the student's transcript.

Recommendation:

Some consideration need to be given to clarifying the issue of intellectual property rights and expectations with respect to authorship of publications. While some statements on these matters are made in the Guidelines of the School, (pages 16, and 18-19) more details are necessary in our opinion. Recent publications from AUCC and CAUT may be useful in this regard. Given the importance placed on publication of graduate research by the School, this issue should be addressed as soon as possible.

Response:

In its June 1996 retreat, REM has started to discuss the issue of intellectual property rights and expectations regarding authorship of publications. At that point, no changes to the general guidelines were made. Further discussion on this issue is planned for the 1997 Retreat when the Ph.D. program will be reviewed. The issue of intellectual property rights and expectations regarding authorship of publications is most relevant to the Ph.D. program. The goal of these discussions will be to add additional detail to REM's Guidelines regarding this issue.

Recommendation:

The School should continue to ensure a mix of both academic backgrounds of incoming students between those with work experience and those coming directly from other academic programs.

Response:

During the process of accepting student applications, REM has always ensured that its students represent a variety of academic backgrounds and that its student body includes students with considerable work experience. This practice is largely responsible for the success of the program. REM will continue to do this.

Recommendation:

The School should monitor closely for the first few years the completion rate of students in the MRM/MBA joint program to see if the published timetable is reasonable.

Response:

REM will continue to monitor student completion times in all of its programs, including the MRM/MBA program.

POINTS FOR CONSIDERATION

Consideration:

To ensure the continuation of student satisfaction with the programs and to check the suitability of training for employment, the School might wish to explore the introduction of exit surveys of graduating students to formally solicit their opinions of the courses and programs.

Response:

This mechanism is already in place.

Consideration:

To ensure that students are continuing to make adequate progress in their programs, the School may wish to institute annual diagnostic interviews with students to up date their records on requirements completed and to record formally the state and level of their progress in their program.

Response:

A formal mechanism of tracking the progress of students has been in place for many years. Students are required to complete forms that keep track of their progress. In these forms students have to demonstrate progress in their course work and research at various times during the program. The student supervisor and the Chair of Graduate Studies have to sign these forms and make a statement whether the student has made sufficient progress to continue the program. The main purpose of these forms is to ensure that students indeed make the progress that is expected. REM has

recently developed a computerized graduate student progress-tracking system. This system holds up-to-date records on course completion rates and progress in research projects. This system will further help to ensure that students make adequate progress in the REM program.

University Resources and Linkages

In this section of the review, the committee reports that library facilities are adequate for the REM program. This observations is not shared by students and faculty in REM. The library contains few serials in the area of resource and environmental management. This is largely due to the limited resources allocated to the library to cover REM's needs. The review committee's report supports this by stating that funding for REM serials is significantly below that of science programs at SFU.

Issues regarding space and linkages between REM and other departments have been discussed earlier.

RECOMMENDATIONS:

Recommendation:

The School should maintain strong liaison with the Library, and become more proactive on relevant committees and in providing input into the Library decision-making process with respect to resource allocations. This should also include liaison with external fund-raising sources. In an era of change and cutbacks, it is essential to make sure that the Library is constantly informed about present and future needs of programs and how these are likely to change.

Response:

REM agrees that maintaining a strong liaison with the Library is important. REM has had representation on the Science Library Users Committee fro many years.

Relationship of the School and the Professional Community

REM agrees that they have very good relationships with the professional community and that they have kept excellent ties with their graduates.

RECOMMENDATIONS:

Recommendation:

The School should consider the establishment of an External Advisory Committee, which would include representation from the private and public sectors and alumni, to advise the School on potential innovations and changes in programs, funding opportunities and other relevant matters. Such a committee might meet once or twice a year and would provide an opportunity for the School to receive input from those sectors of the community most involved with its operations and its students. Participation would be voluntary and unpaid, but reaction from those in these sectors to whom the idea was proposed during our visit was strongly in favour.

Response:

In its 1996 retreat, REM has agreed to develop an External Advisory Committee. REM is currently looking for members for this committee.

Recommendation:

The School should explore ways to give students greater exposure to international examples and approaches; to aboriginal issues and viewpoints; and to culturally diverse opinions and values. The professional community see these issues as being increasingly important in resource and environmental issues, not only in British Columbia, but elsewhere in North America and the Pacific region. Increasing use of adjuncts and visiting speakers in courses, and twinning and exchanges with other Schools and programs were approaches suggested.

Response:

To provide students with greater exposure to international issues, REM has signed in 1996 a student exchange agreement with Universities in the US and Mexico. This program, which has received outside funding, will allow REM students to study in the US and Mexico on issues related to the NAFTA. As part of the agreement, students from the US and Mexico will visit REM. REM also has a student exchange program with Universities in Australia (Fill in) and ?? . Another twinning program is currently being set up with the University of Aberdeen.

REM students have also been involved in professional courses offered to agencies in China and Korea. The Eastern Indonesia Project, in which REM is involved, provides further opportunities for students to gain international experience.

To provide students with more experience in aboriginal issues, REM developed and offered a course in "First Nations". Unfortunately this course had to be cancelled for the 1996/1997 academic year due to budget cuts.

POINTS FOR CONSIDERATION

Consideration:

The School should consider introducing refresher or short courses for former graduates and others with comparable qualifications to bring them up-to-date on current research techniques. These courses could provide a source of revenue to the School as well as furthering its visibility and reputation with the professional community. Care would need to be taken, however, in terms of faculty compensation, either in teaching relief or financial compensation.

Response:

This suggestion is a good one. Lack of time currently prevents REM from offering refresher courses for its graduates.

Consideration:

The School should consider ways to further integrate information on Non-Governmental Organisations into student training, as increasingly these groups are playing active roles in resource and environmental decision-making, and providing employment opportunities for graduates.

Response:

The role of non-governmental organisations (NGOs) in natural resource management is covered in REM 601. REM agrees that NGO's play an important role in natural resource management and that information about these organizations should be discussed whenever that is appropriate.

V. STRATEGIC PLAN

Programs:

Goal #1

REM's first and foremost priority is to maintain its graduate programs (i.e. the Masters in Resource Management, Ph.D. in resource management, MRM/MBA programs) at the current level of enrollment (at an average of 80 FTE) and to further improve the quality of the graduate programs.

Requirements:

To achieve this goal, REM does not require an increase in funding or staffing. However, REM does require an addition of student office space and adequate laboratory facilities to create a working and research environment for students and facilities that is comparable to those in other departments at SFU.

Goal #2

REM will be seeking an active role in environmental education at the undergraduate level at SFU. REM is prepared to implement an undergraduate program in REM or to provide courses in support of the Environmental Science and Environmental Studies Programs subject to the availability of funding to cover all costs associated with the increase in its responsibilities. Due to its experience at the graduate level; its excellent relationships with the professional community and its success in placing students in full-time positions in the resource and environmental area, REM believes that it is uniquely positioned in SFU to contribute to undergraduate education in the environmental area.

Requirements:

Requirements for the establishment of an undergraduate program in Resource and Environmental Management has been documented in the BREM proposal, that received academic approval by Senate in April 1996 (check date).

Goal #3

REM intends to further expand its Co-op program and improve the quality of the Co-op experience by providing formal evaluations of student work terms.

Requirements:

Considering that REM has the largest graduate Co-op program at SFU, REM will require part-time funding for a Co-op coordinator to meet its goal of offering an expanded and higher quality Co-op program.

Goal #4

REM intends to develop a Cooperative Resource Management Institute (CRMI) at Simon Fraser University. The proposed Institute will stimulate, encourage, and enhance cooperative research between students and faculty in the School of Resource and Environmental Management and personnel in resource management agencies. The Institute will provide a focal point for frequent interaction between those who are involved with management of natural resources and SFU faculty, graduate students, post-doctoral fellows, and research associates. The Institute will provide REM with an increased critical mass in several areas in resource management. The university will also benefit from greater concentration of expertise in resource management on campus and from new opportunities for multidisciplinary, collaborative university-agency research programs. A proposal for the development of the Cooperative Resource Management Institute is attached.

Requirements:

? || REM will require office space to house the members of the Institute. Initially, REM will require space for 3 research scientists. If the Institute is successful, an additional 3 spaces will be required in the year 2000. The VP Academic has made a commitment to REM to provide space for the CRMI in the 1997. The Dean of FAS has made a commitment to provide funds for renovation.

Goal #5

To address REM's problem regarding the lack of student space and inadequate laboratory facilities and common room, REM will pursue an active strategy to obtain appropriate facilities. Considering that REM is currently working in insufficient and inadequate space, REM is expected to be at the top of the priority list in terms of infra-structure improvement initiatives at SFU.

Goal #6

REM will pursue the establishment of endowed chair(s) in resource and environmental management to gain additional critical mass in several research areas.

Requirements:

REM will require office and laboratory space to accommodate endowed chairs.

Goal #7

REM will attempt to improve REM's visibility on campus by (i) improving current signs on campus and adding new ones and (ii) adding display cases to publicize its activities.

Goal #8

REM will review the operation of the Ph.D. program. One of the goals of this review will to evaluate the process of student admission and supervision. At this time, the issue of intellectual property rights and expectations regarding authorship of publications will be further discussed with the ultimate aim of updating the guidelines of REM on this issue.

Goal #9

To further improve gender and minority distribution in its faculty, REM will review the gender status of its adjunct faculty and will aggressively seek to attract high quality academics and professionals from women and minority groups for adjunct professor positions in REM.

Goal #10

To ensure a highly effective and motivated staff in the future, REM will continue to provide opportunities for training to its staff. REM will further evaluate current procedures for formal annual job and performance reviews.