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MEMORANDUM

ATTENTION	Senate	**DATE**	March 01, 2021
FROM	Catherine Dauvergne, Vice-President, Academic and Provost, and Chair, SCUP	**PAGES**	1 of 1
RE:	External Review Mid-Cycle Report School of Resource and Environmental Management (SCUP 21-06)		

The External Review of the School of Resource and Environmental Management was conducted in March 2017. As per Senate guidelines, the Unit is required to submit a mid-cycle report describing its progress in implementing the External Review Action Plan. At its February 17th meeting SCUP reviewed the School of Resource and Environmental Management's mid-cycle report.

The mid-cycle report, the Unit's assessment of its Educational Goals, and SCUTL's Feedback on the Educational Goals are attached for the information of Senate.

C: M. Jaccard

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MEMORANDUM

ATTENTION	Catherine Dauvergne, Chair, SCUP	**DATE**	January 25, 2021
FROM	Wade Parkhouse, Vice-Provost and Associate Vice-President, Academic	**PAGES**	1 of 1
RE:	External Review Mid-Cycle Report for the School of Resource and Environmental Management		

The External Review of the School of Resource and Environmental Management was undertaken in March 2017. As per the Senate guidelines, the Unit is required to submit a mid-cycle report describing its progress in implementing the External Review Action Plan and the assessment of its Educational Goals. The update on the Action Plan has been reviewed by the Faculty Dean. The Senate Committee on University Teaching and Learning (SCUTL) has provided feedback to the Unit on the assessment of its Educational Goals. The recommendations from SCUTL will be incorporated into the Unit's self-study report for the next external review.

The following documents are attached for the information of SCUP:

- Update on the Action Plan
- Assessment of Educational Goals
- SCUTL's Feedback on the Educational Goals

c: Mark Jaccard, Director, School of Resource and Environmental Management
Naomi Krogman, Dean, Faculty of Environment

SFU FACULTY OF ENVIRONMENT | RESOURCE AND ENVIRONMENTAL MANAGEMENT

Memo

ATTENTION	Bal Basi, Coordinator, Office of the Vice President, Academic
FROM	Mark Jaccard, Director, REM
RE	REM External Review Mid-Cycle Report
DATE	October 29, 2020

Dear Bal,

As requested, REM has completed the Mid-Cycle Report that documents the progress made towards the Action Plans set in the REM External Report conducted in March 2017. Please see the attached filled-in template report.

Feel free to contact us if additional information is required.

Sincerely,

Mark Jaccard
Director, REM

External Review Mid-Cycle Report for the School of Resource and Environmental Management	
Action	**Progress Made**
1. Programming	
1.1.1 Undergraduate	
• REM recognizes the critical importance of developing a successful undergraduate program. The REM Undergraduate Curriculum Committee will review and propose changes to the BEnv REM degree requirements to address most of the ER recommendations. REM is also in the process of hiring a new full time Lecturer to provide consistent delivery of several key undergraduate courses.	The REM undergraduate committee conducted a thorough review and update of the REM Major curriculum in 2017, including re-design of the educational goals and creation of 8 new REM courses, and this was launched in Fall 2018. The program has been aligned with our graduate program with a core foundation in policy, science (applied ecology) and economics. Since then, REM has also added a REM (Planning) Stream, with preliminary accreditation from PSB, and a REM Honours degree. A full-time senior lecturer was hired in January 2017 (S. Harrison). With the addition of the senior lecturer and program modifications, REM has seen a substantial increase in program and course enrollments. Our undergraduate enrollments increased by 16% in 2017/18, 31% in 2018/19 and 21% in 2019/20. Two Planning faculty members (T. Soma and A. Doyon) also have been hired as replacements to support our Planning programs. Current priorities include the transfer of the Sustainable Development program from the Dean's Office to REM and the updating of its curriculum to align and integrate better with the REM undergraduate program. Increasing the teaching of SD courses by permanent REM faculty is a key component of the transfer plan.
1.1.2 Graduate	
• REM will overhaul the MRM program with the goals to (1) reduce overall graduate supervision loads by REM faculty, especially of course-based Master's students; (2) create conditions for improving faculty and graduate student research productivity, and (3) improve overall graduate student experiences, including reducing completion times in the MRM. As recommended by the ER, the REM Graduate Studies Committee is already working to create separate course-based	The MRM thesis program was successfully launched in 2018, which reduces the course requirement to six for thesis stream students (inclusive of the REM field course and the research methods course). REM reduced the MRM project-based program by two courses to facilitate quicker completion times.

(20 months) and thesis-based (30 months) MRM streams. Initial revisions to the MRM programs will be targeted to incoming students for the Fall of 2018, with additional revisions expected after our strategic planning process is complete (see below). Course requirements under MRM course-based and thesis-based programs will be designed to optimize graduate student learning opportunities with the 20 or 30 month completion time frames, respectively.	We have moved to a single senior supervisor model for the project-based MRM stream (inclusive of a second faculty reader at the oral defence), which is anticipated to further reduce completion times. Completion times have been slightly reduced for master's students, but the full effect of introducing the master's thesis stream and other initiatives will not be known for a few more years.
• REM is currently overhauling the REM PhD program with the goal of improving faculty and PhD student research capacity and productivity. This goal will be achieved by modifying PhD program requirements to (1) reduce the time required to complete the breadth requirements from the current 22 month average to 4 months and (2) reduce pre-determined interdisciplinary requirements in the PhD thesis to allow individualized PhD research that better suits faculty and student interests. Specifically, we will (i) substitute the current PhD breadth comprehensive exam process with a simpler requirement that students complete (with good results) a small set of courses by the end of the first semester (second semester in exceptional circumstances) and (ii) revise the proposal defense requirement to be completed by the 4th semester. Other changes will include simplifying the interdisciplinary and committee membership requirements to improve research flexibility and reduce overall supervisory loads for REM faculty.	REM has completed its intended revisions to the PhD program, notably by replacing the breadth comprehensive exam process with a research proposal exam (thereby better focusing student and committee efforts to the research design process right away), and the requirement that students complete three core courses. We have adjusted the interdisciplinary requirements by adding flexibility to the course program, to be completed by the student and their senior supervisor, and approved by the graduate chair.
2. Research	
• REM faculty have a long history of collaboration within SFU and providing opportunities for postdoctoral research and training, which will continue as opportunities and funding arise; however, losses of research faculty over the past several years to retirement (e.g., a CRC Tier I Chair), accidental death, resignation, and health-related work reductions limit our	REM faculty have been successful in developing research programs and receiving grant funds to support RA and postdoctoral hires. Currently, REM has 6 Post-docs working for REM faculty and Adjunct faculty members.

capacity to seek out and support postdoctoral researchers, especially considering the high overhead expenses for postdoctoral researchers.	In spite of our reduced faculty, REM continues to support collaborations among REM faculty and with faculty elsewhere in SFU.
3. Administration	
• REM will develop a strategic planning process beginning in September 2017 with expected completion by the REM Faculty Retreat in Spring 2018. Faculty succession and renewal, gender diversity, and fiscally realistic teaching obligations will be key topics within this process.	REM has acted on its EDI priorities for hiring, with two new female tenure track hires and one male hire. REM will continue to prioritize hiring to reflect our student body and diverse population. Faculty succession planning continues to be a challenge with an aging faculty complement and a very limited FENV budget available for hires This situation is exasperated by REM's fast growth and expansion into new undergraduate programs, such as its planning degree.
4. Working Environment	
• Enhance diversity in the professoriate and the student body, in particular, adding more women to the faculty and generating a more diverse student body.	Of REM's four latest faculty hires, two are female and one of the two males is First Nations. REM continues to attract a graduate student body of 60-70% females. REM prioritizes EDI for all hires.
• School to explore opportunities with other academic units to enhance program reach/market and efficiencies.	REM has taken on the commitment to administer and develop the courses that were originally identified as Sustainable Development. REM is helping Geography with the development of a minor in climate and society.
5. Other	
• Educational goals are being revised to align with the proposed changes to all REM degree programs.	Both the REM undergrad and graduate program educational goals have been revised.

SFU FACULTY OF ENVIRONMENT | RESOURCE AND ENVIRONMENTAL MANAGEMENT

ATTENTION	Bal Basi, Coordinator, Office of the Vice President, Academic
FROM	Dr. Mark Jaccard, Director, REM
RE	REM Educational Goal Mid-Cycle Assessment
DATE	November 4, 2020

REM Graduate Program

REM went through an extensive two-year process in 2016-2017 to consider and develop educational goals for the graduate program, inclusive of the MRM-project, MRM-planning, and the PhD program. The process consisted of the following steps:

- Mapping of core competencies;
- Conducting a research report, survey of 33 resource and environmental management (like) programs in North America to identify and compare educational goals/learning outcomes;
- Engaging faculty in a curriculum and course review process; and,
- Workshopping draft EGs at the annual retreat;

The outcome of this effort was the production of the Educational Goals Framework for the program (Appendix A).

Over the past two years, we have used, updated the EG Framework in two areas. First, we used the EG Framework in a reflexive manner to inform the development of our 2018-2023 Strategic Plan. Second, we aligned the EG Framework with the development of the MRM-thesis stream (launched in 2018) to ensure that core goals remained within the revised (and reduced) course structure associated with the MRM-thesis program. Our aim is to ensure that all of our grad students have a core interdisciplinary applied training that covers natural science, economics and policy, and that closely matches the societally engaged and environmentally sustainable objectives of SFU.

REM Undergraduate Program

Similarly, in 2017 the REM Undergraduate Curriculum Committee revised the Educational Goals (Appendix A) that were associated with the original major program when it was hosted in the Dean's office. This revision was done subsequent to transferring the program from the Dean's Office to REM and was carried out after the 2017 External Review documents were prepared. The EGs were revised as the following:

Graduates of the REM major are expected to understand the importance, theory and practice of management and decision making in REM as articulated in the following educational goals:

1) Ability to analyze resource and environmental management challenges from an interdisciplinary perspective, drawing on approaches used in the natural and social sciences.

2) Understanding of indigenous and First Nations perspectives in natural resource and environmental management in Canada.

3) Knowledge of quantitative methods and tools that are used to inform decision-making, and ability to apply several of these tools to real world problems in natural resource and environmental management.

4) Understanding of the importance of uncertainty in resource and environmental management and ability to identify and evaluate trade-offs in decision-making in the presence of uncertainty.

5) Knowledge of the principles of effective communication and ability to apply these principles to natural resource and environmental management in a variety of professional settings.

6) Ability to critically evaluate reports (e.g. environmental impact assessments) and media related to natural resource and environmental management.

7) Understanding of legislation, policy and regulatory frameworks and their role in natural resource and environmental management in Canada.

8) In-depth understanding of at least one natural resource and environmental management sector in Canada.

The revised goals were developed in part from the accumulated knowledge and experience with the REM Graduate Program but were expressed in a simpler and more direct way, which seemed appropriate at the undergraduate level. The goals were vetted within REM, first by the REM Undergraduate Committee and then by the entire REM faculty at an annual REM Faculty Retreat.

The revised 2017 goals are still current and have been used to guide further program and course development at the undergraduate level. For example, we have at least twice carried out exercises to map our current course offerings against these goals to identify gaps in course offerings, including a substantive curriculum mapping exercise held during our annual REM Retreat several years ago. Most recently (and ongoing), we are using the Educational Goals to map content in our core undergraduate courses to ensure these goals are being met within the more restrictive grouping of core courses only. The exercise consisted of sending a short survey to core course instructors and asking them to complete a table where they checked off those goals that they were targeting within their specific course. We will use this information to

reconsider our current offerings and as a guide for redesigning existing courses or developing any new core offerings.

SFU FACULTY OF ENVIRONMENT | RESOURCE AND ENVIRONMENTAL MANAGEMENT

Appendix A – REM Educational Goals 2017

Undergraduate Programs

Undergraduate Programs Overview

REM's role in undergraduate teaching was quite minor historically; however, our undergraduate programming has undergone major changes in structure, content, and enrolment since the last External Review in 2010. At present, REM undergraduate programs include a REM Minor and a REM Major. The new Bachelor of Environment (BEnv) major in Resource and Environmental Management (REM) will be owned and administered by REM as of January 2017. Initially, the BEnv REM major originated in September 2014 as the Environmental and Resource Management (ERM) major, which was intended to prepare students for junior resource management positions or to continue in graduate studies, for example, in energy, fisheries, agriculture, forestry, cultural resources, and tourism. Students are expected to gain a solid understanding of the structure, function and interplay of social and biophysical systems, a basic ability to use geospatial, modeling and other analytical methods and tools in support of decision making, develop a good understanding of the role of policy and governance in resource management, and acquire some depth in one sector of resource management. While it is too early in the life of REM's undergraduate program to know if it has successfully targeted student demand, initial student interest and program enrollments beyond the expectations expressed in the Major program's proposal suggest that it has found a niche (see below).

BEnv REM Major

The REM major will take full advantage of the expertise existing across FENV units by including core requirements characteristic of BEnv majors such as focusing on the social and natural sciences, methodologies needed in resource management, communication, and a capstone experience that requires students to apply and integrate knowledge and skills acquired in the program. Recruitment will focus on four potential sources of students: current students in FENV; undecided students at SFU; new students from secondary schools and university transfer programs; and new students through SFU's dual entry program (e.g. Douglas College). Currently, the REM major can be mounted at a relatively low cost by using primarily unfilled seats in existing courses, increasing class sizes where appropriate (and possible), and developing a limited number of new courses as required. While it was expected that the ERM major would reach a steady enrollment of approximately 75 students once it has matured, the REM major already has 109 declared majors (October 2016), so it is substantially ahead of the target. Limits on some class sizes and room availability are already beginning to create bottlenecks for further enrolment in some REM courses.

Educational Goals for the REM Major Program

Graduates of the REM Major are expected to understand the importance, theory and practice of management and decision-making in REM as articulated in the following educational goals:

1. Analyze resource management challenges from historical, biophysical and socio-cultural perspectives, including differences among and implications of indigenous and First Nations perspectives.

2. Analyze resource use and sustainability in terms of biophysical and socio-cultural processes and their interactions.

3. Apply geospatial, statistical and systems modeling to inform management and conservation of biophysical and socio-cultural resources.

4. Integrate biophysical and socio-cultural information to identify trade-offs and uncertainties in REM decision-making.

5. Apply principles of effective communication and conflict resolution to multi-stakeholder negotiations.

6. Critique and analyze common REM documents, using REM principles.

7. Evaluate legislation, policy and regulatory frameworks related to resource conservation, management and use.

8. Demonstrate subject area knowledge of at least one resource management sector.

The BEnv REM curriculum was designed specifically to meet these goals. For example, at the lower division, required course topics include First Nations studies, public policy, introductory statistics and GIS, systems thinking, biology and ecology, and cultural heritage. Upper division courses fall into similar broad categories, but with greater depth and specialization. Categories include First Nations and Social-cultural perspectives, Biophysical perspectives, Resource Management, Ecological/environmental economics, Decision making methods and modelling, Communication and Conflict Resolution, Legislation and Policy, and a final Capstone Experience.

The BEnv REM program is currently heavily focused on coursework, with some opportunities for students to engage in novel experiences and knowledge generation via the capstone experience. Although several REM professors engage undergraduates in summer research terms, as we develop this program further we could include, for example, an Honours Thesis option. This, of course affects the workloads of REM professors who already carry heavy research supervision loads.

REM Minor

The REM Minor credential provides undergraduate students with the basic skills and understanding they need to integrate natural and social systems concepts into resource management applications. The REM minor fills a gap in interdisciplinary environmental-related minor degree options at all BC Universities, including SFU. The 24 units comprising the REM minor aim to establish student abilities to: (1) understand and articulate how the dynamics of natural and social systems are inter-related in resource management issues; (2) explain how natural resource management strategies and techniques are formulated for environmental planning and decision-making; and (3) demonstrate the biological, physical, social, economic, and institutional implications of resource and environmental management decisions. At present (October 2016), there are 18 students registered in the minor.

Educational Goals for the REM Minor Program

The overall goal of the REM Minor is to provide an interdisciplinary education in the theory and application of resource and environmental management concepts to modern environmental issues. Graduates of the REM Minor are expected to understand practical research and analytical methods, and to possess personal skills, such as collaboration, ethics and communication, as articulated in the following educational goals:

1. Familiarity with major Canadian and global environmental issues, their causes, and consequences.
2. Ability to identify and describe the inter-relationships among ecological, economic, institutional, cultural, and policy aspects of environmental issues.
3. Familiarity with quantitative and qualitative tools used in decision-making and ability to apply basic tools to real-world natural resource management problems.
4. Ability to describe how natural resource managers integrate natural and social systems concepts into management applications.
5. Ability to collaborate and communicate in interdisciplinary problem-solving.

Course requirements for the REM Minor involve a substantial exposure to REM's upper division undergraduate courses. Thus, REM Minor students have many opportunities to achieve the educational goals as articulated above.

REM Undergraduate Courses

At the time of the last External Review in 2010, REM offered six undergraduate service courses to the Environmental Science Program (now in the Faculty of Environment) and the environment-related specializations offered through the Department of Geography (also now in the Faculty of Environment). One of these --- REM 100 Global Change --- is a longstanding lower division course, which has been required for environmental majors and a designated "breadth course" at SFU, historically has attracted students from a broad range of majors.

Currently, REM has 17 undergraduate course offerings listed in the calendar; nearly triple the number since 2010. Enrolment in these courses has increased steadily year-to-year from 52.5 FTE's in 2008-9 to 96.7 FTE's in 2015-16. Feedback from students via course evaluations, anecdotal reports from undergraduate advisors, and increasing enrolments all indicate that REM undergraduate courses are successful and in high demand. For instance, we now offer two sections of REM 100 (Fall/Spring) at the Burnaby campus. New courses such as REM 200, which now serves as the core requirement in both Major and Minor, use innovative approaches; in this course an experiential approach is used whereby each REM research group leader gives a guest lecture that focuses on their current research and its links to management. Another newer course, REM 350 Sustainable Energy and Materials, did not exist in 2010 and now attracts over 200 students, while, REM 370 Ocean Resources, attracts almost 40 students. Overall, REM's undergraduate FTE's increased by 21.6% over the past year alone, while undergraduate FTE`s for the university as a whole declined by 0.03%.

Comparison to Other Programs

The REM major and minor are unique as stand-alone credentials. Most programs at SFU, as well as other universities in British Columbia and Canada, dealing with "environment" mainly begin from an underlying disciplinary (mostly natural sciences) focus such as Forestry or Forest Resource Management (UBC), Natural Resource Science (Thompson Rivers U.), or Wildlife and Fisheries (UNBC). Our REM undergraduate programs are based on the premise --- gained over decades of professional experience of faculty, collaborators, and REM graduates --- that environmental management problems are fundamentally interdisciplinary. Thus, we deliberately designed the BEnv REM and REM Minor curricula to meet interdisciplinary goals. Additional opportunities to extend the experiential and work

experience aspects of the program (e.g. Cooperative education) exist in order to reinforce the classroom based educational experience of REM undergraduates. As REM's experience with undergraduate programming grows these and other new opportunities for the Major/Minor, such as an expanding list of REM courses to meet our needs and to replace courses included from other departments/Faculties, will need to be explored.

Most Pressing Issues

Despite the immediate success apparent for our new undergraduate programs, we continue to be cautious, and even somewhat concerned, about how to manage our increasing undergraduate program growth and responsibilities, as well as how these demands will affect our graduate programs (see Graduate Programs section). Given our projected faculty complement in the medium term (i.e., taking into account reduced workloads and impending retirements), existing resources will not be adequate to support involvement at the undergraduate level without adversely affecting our ability to run our graduate programs to their expected quality. Thus, we hope that our enthusiastic development of the undergraduate programs will result in a commensurate increase in resources (e.g. part-time advisor, research and teaching faculty positions, etc.) to enable this growth. By increasing our resource base, REM will be able to gain greater control over the content within all of our undergraduate programs, since most of the courses within the BEnv REM are currently taught outside REM. From a student perspective, the newness and unfamiliarity of REM within the undergraduate domain will need to be addressed as the program moves forward. Students will need to be engaged with REM through more than their coursework and given the range and depth of REM's faculty complement there are ample opportunities for this engagement.

Graduate Programs

Structure and educational goals

The REM graduate program comprises three degree options: the Master's in Resource Management (M.R.M.), the Master's in Resource Management (Planning), and the Doctor of Philosophy (Ph.D.). Overall, there are currently 112 students enrolled across the three degrees with 46 in the M.R.M., 33 in the M.R.M. (Planning), and 33 in the REM Ph.D.

Master's in Resource Management (M.R.M.)

The M.R.M. is a professional Master's degree designed for recent graduates from a range of disciplines and also for individuals who have been employed in private organizations or public agencies dealing with natural resources and the environment. The M.R.M. program combines course-work with an applied research project to provide an interdisciplinary education in concepts, theories, and methods for understanding and addressing modern environmental and resource management problems. Some students enter the M.R.M. program directly from undergraduate programs, but many have had work experience between their undergraduate degree and entry to REM. Relevant disciplines of undergraduate training or experience include biology, engineering, chemistry, forestry and earth sciences, as well as business administration, economics, geography, planning, environmental sciences, environmental studies, and a variety of social sciences programs. Most courses for the M.R.M. are offered at our Burnaby campus during normal weekday time slots; however, courses are occasionally scheduled in the evenings, or for week-long blocks, or as field courses to accommodate working students or particular educational goals (e.g., field experience). The optional Co-operative Education Program allows students to work in a private organization or a resource management agency to gain first hand experience while obtaining their degree. The M.R.M. degree mainly provides training for professional careers in private or public organizations involved in resource and environment-related fields, although some graduates continue training for research and academic careers.

Educational Goals for the M.R.M.

The (proposed) educational goals for the M.R.M. program are set out in Table 11.1A.

Table 11.1A. Educational Goals for the M.R.M. Program

Category	**Educational Goal**	**Components/Definition of Educational Goal**
Knowledge and Understanding	*Interdisciplinary knowledge and understanding (breadth)*	☐ Knowledge and understanding of prominent concepts, theories and methods in the core academic fields relevant to resource and environmental management, including environmental science, ecological economics, the social science of natural resource management, and public policy/planning
	Disciplinary knowledge and understanding (depth)	☐ Deep and systematic understanding in the specialized field of study selected for the student's research, including the relationship of this field to other relevant disciplines
	Knowledge and appreciation of diverse perspectives and values	☐ Knowledge and appreciation of the perspectives and values of individuals and groups involved in resource and environmental management, including Indigenous/Aboriginal peoples, stakeholders and other interests ☐ Knowledge about how to seek out diverse perspectives to inform research and practice
Performance and Practice	*Research and problem solving skills*	☐ The ability to select and apply appropriate methodologies for inquiry and analysis (the collection, management, evaluation and interpretation of data), including specific quantitative or qualitative

		methods such as risk assessment, statistical analysis, surveys and qualitative interviewing - The ability to integrate and apply knowledge, theory and methods from multiple disciplines to analyze and address problems in resource and environmental management - The ability to apply effective decision-making methods (collective and individual) under conditions of uncertainty and risk
	Communication and engagement skills	- The ability to present information (e.g., research and results) and communicate effectively orally and in writing in a variety of contexts to diverse audiences, including interdisciplinary and multi-stakeholder groups - Knowledge and skills in respectful and reciprocal engagement and collaboration with Indigenous/Aboriginal peoples, stakeholders and other interests
	Ethical awareness and application	- The ability to describe and contrast ethical perspectives related to resource and environmental management - A critical ethical dimension to the student's own academic and professional practice
	Leadership skills	- The ability to participate effectively in, and lead, multi-disciplinary research teams and other groups
Cognitive Skills	*Creativity and innovation*	- Creativity and innovation in analyzing problems in resource and environmental management and designing research and other

		strategies to address these problems
	Critical thinking	The ability to critically evaluate different conceptions of the goals of resource and environmental management (e.g., multiple-use, sustainable development, resilience)
		The ability to critically evaluate theories, research methods, models and approaches in resource and environmental management (e.g., in reports and journal articles)
		An understanding of how theoretical and methodological approaches, framing and other biases affect the ways in which problems are formulated and evidence is interpreted
	Self reflection and learning	The ability to be self-critical and to reflect on the student's own functioning and the functioning of others in order to improve practice
	Independence and responsibility	The ability to act independently and with originality in research and problem solving

Coursework for the M.R.M. Degree

Students in the M.R.M. program take an integrated sequence of courses in complementary fields, pursue further courses in their area of specialization in the School or elsewhere in the University, and complete a major research project. The aim is to increase familiarity and competence in understanding the dynamics of natural resources, the strategies and techniques of natural resource and environmental planning and management, and the biological, physical, social, economic and institutional implications of resource decisions. Students also become familiar with various quantitative and qualitative methods of analysis and

aids to decision making in the presence of uncertainty. In the field of natural resource and environmental management, in particular, it is important that an academic program stress problem-solving as well as creative and critical thinking skills, rather than focusing solely on specific subject matter such as fisheries, resource economics, or forestry.

Core required courses for the REM Master's programs are:
REM 601-5: Social Science of Natural Resources Management
REM 611-5: Population and Community Ecology
REM 621-5: Ecological Economics
REM 631-5: Earth Systems and Global Change in Environmental Management REM 801-5: Principles of Research Methods
REM 698-3: Field Resource Management Workshop (This is a mandatory field course for all new REM Master's and Ph.D. students normally held the week prior to the start of the fall term. REM 698 provides an opportunity for students and faculty to get acquainted, and introduces students to a variety of resource management issues that are discussed in the program.)
REM 699-10: Research Project
AND one of either:
REM 642-5: Sustainable Community Planning and Regional Development, OR REM 644-5: Public Policy Analysis and Administration

In addition to these required courses, M.R.M. students take 4 elective courses, usually focused on their areas of specialization. In the fall of 2015, we instituted a major change to the M.R.M. program by reducing the number of elective courses required for the degree from 6 to the current level of 4. This change was instituted in response to concerns about the combination of a heavy course load and a major research project required for the degree, and that this combination was contributing to completion times that often exceeded 2 years. We are now monitoring the effects of this change in the number of electives, and we expect that it will lead to reduced completion times for the M.R.M. degree. Under the new requirements, the coursework should normally fill the fall and spring semesters in the first academic year and the fall semester of the second academic year, so that students will be able to complete and defend their Master's projects before the end of their second academic year.

Elective courses are offered in a broad range of areas, including:

- environmental toxicology and management
- simulation modeling
- environment and development

- risk assessment and decision analysis
- sustainable energy systems
- forest ecosystem dynamics and management
- water security, water planning and management
- environmental impact assessment/environmental management systems
- tourism planning and development
- community planning
- environmental law and regulation
- fisheries assessment and management
- outdoor recreation & parks planning

M.R.M. research project – REM 699

The M.R.M. research project (commonly referred to as the "699 project") provides the opportunity to conduct original, interdisciplinary research incorporating methods and/or ideas from more than one discipline. Student projects often evaluate the performance of existing natural resource management institutions, policies, practices, and methods. In some cases, usually where students have deeper subject-area expertise, new methods and policies may be developed. Innovative strategies may emerge from research into the biological dynamics of natural resources, or the institutional, social, economic or public policy aspects of their management. The emphasis in course materials and research projects is not simply to identify and describe resource and environmental problems, but to understand how underlying processes work so that acceptable and feasible solutions can be designed. Researchers apply a range of approaches including simulation modeling, legal and institutional assessment frameworks, bio-economic modeling, benefit-cost analysis, field experiments, and social survey methods to address critical and emerging natural resource management issues on local, national, and international scales. Student research is often conducted in collaboration with resource management agencies or other external organizations to facilitate access to data and implementation of research results. Suitably qualified staff from external organizations frequently serve on student supervisory committees.

Because of the number of courses required for the M.R.M. degree, the 699 research project is usually scoped to be smaller than a typical Master's thesis, but should be of equivalent publishable quality. Many 699 projects result in papers that are published in high-quality journals, and many REM Master's students have received awards for their published papers and presentations at conferences.

For a sample of completed M.R.M. student research projects, see our REM website: http://www.sfu.ca/rem/research/thesis.html

Master's in Resource Management (Planning)

In 2004, REM began offering an M.R.M (Planning) degree. The Resource and Environmental Planning Program (REPP) is a separate academic unit within the School of Resource and Environmental Management headed by a Director. REPP is accredited by the Professional Standards Board for the Planning Profession in Canada, which means that students who receive the degree of M.R.M. (Planning) are eligible for candidate membership in the Canadian Institute of Planners and the Planning Institute of B.C. Thus, the M.R.M. (Planning) degree confers the same professional recognition as a planning degree at any other planning school in Canada. Four of REM's full time faculty members are qualified as Registered Professional Planners with the Canadian Institute of Planners and the Planning Institute of BC, as are 2 of our emeritus professors and 7 of our adjunct professors.

Educational Goals for the M.R.M. (Planning)

Students in the M.R.M. (Planning) program must meet all of the educational goals established for the M.R.M. program (see Table 11.1A above). In addition, M.R.M. (Planning) students must demonstrate certain competencies specified by the Professional Standards Board (applicable to all accredited planning programs in Canada). At the time of each renewal of our accreditation as a planning program, the Professional Standards Board appoints an external review panel to evaluate the M.R.M. (Planning) program against these specified competencies. The Professional Standards Board also conducts a less formal review of the program's status annually.

The "functional competencies" and "enabling competencies" against which Canadian planning programs are currently assessed are set out in Table 11.1B.

Table 11.1B. Functional and Enabling Competencies required by the Professional Standards Board for Planning Programs in Canada

Functional Competencies

Human Settlements	History & Principles of Planning	Government and Law	Issues in Planning and Policy-Making	Processes of Planning and Policy-Making	Plan and Policy Implementation
Forms, scales and settings of human settlements	History of planning in Canada and other countries	Political and institutional frameworks of planning	Environmental, social and economic sustainability	Visioning, goal-setting and problem-framing	Regulatory tools

Processes and factors of change in human settlements	Planning theories, principles and practices	Planning laws	Equity, diversity and inclusiveness	Information gathering and analysis	Fiscal/financial tools
	Planning ethics		Public finance and economics	Public consultation and deliberation	Design and management of public projects
	New developments in planning		Land use, design and infrastructure		Monitoring and evaluation

Enabling Competencies

Critical and Creative Thinking	**Social Interaction and Leadership**	**Communication**	**Professionalism**
Gathering and analysing quantitative and qualitative data	Mediation, facilitation, negotiation, and conflict resolution	Written communication	Managing complexity, uncertainty and change
Identifying patterns and trends	Inclusion of diverse people and values	Oral communication	Learning from practice
Thinking at various geographic scales	Team-work and team-building	Graphic communication	Handling ethical dilemmas
Designing scenarios and plans	Relations to bosses, officials and the public	Use of information technology	

Coursework for the M.R.M. (Planning) Degree

Students in the M.R.M. planning program complete the same total number of credit hours required for the M.R.M. degree. The required courses and the Master's project are also the same as those described for the M.R.M. degree, with the following exceptions: (i) rather than having a choice of taking either REM 642 (Sustainable Community Planning and Regional Development) or 644 (Public Policy Analysis and Administration), planning students must take REM 642; and (ii) planning students must complete three required courses listed below in place of three electives taken for the M.R.M. degree.

REM 602-5: Natural Resource Management II: Advanced Seminar
REM 641-5: Law and Resources
REM 643-5: Environmental Conflict and Dispute Resolution

Students accepted into the M.R.M. program may choose at any time before graduation to complete the M.R.M. (Planning) degree, provided that they meet the course requirements.

The M.R.M. (Planning) degree has become a very popular "value added" option across all research groups at REM; approximately 40%-50% of REM's Master's students are typically enrolled in the planning option. This reflects the desire of students to graduate with the broadest possible credentials and the reality of the availability of planning-oriented jobs. However, for students outside the core planning research groups, this may mean taking extra courses, because they often need to take elective courses for their own specialty (e.g. fisheries, economics) in addition to the specified list of planning courses.

The REM Planning Program was designed to build on REM's strengths and address an unfilled niche among Canadian planning schools by focusing on the increasingly important area of resource and environmental sustainability planning. Although many Canadian planning schools include some training in environmental sustainability planning, none of the other schools have resource and environmental planning as their primary focus. Within this focus, the REM Planning Program offers secondary specialties in land use, natural resources (forestry, fisheries, energy, water, and parks), tourism, First Nations, climate change, and urban sustainability planning.

The REM Planning Program has been very successful and has made an important contribution to planning research and progress. The program has graduated 141 students and has a current enrolment of 33.

The REM Planning Program completed a successful external review by the Professional Standards Board of the Canadian Institute of Planners last year and our accreditation was renewed.

Statement from Current REM MRM Students

From the perspective of the M.R.M. students in the Department of Resource and Environmental Management at Simon Fraser University, the REM experience is positive overall. The program generates a strong network of people with a breadth of knowledge and the strong relationship between students, faculty and staff makes for a great work environment. The M.R.M. degree at REM is a challenging program which stresses the importance of interdisciplinary, applied learning and research. This

produces knowledgeable and multi-talented graduates equipped with the necessary skills to be successful in the workforce or to pursue further graduate studies. The range of classes, high quality of teaching, applied nature of the course work and the interdisciplinary nature of the program combine to make for a valuable education for Master's students. Furthermore, a number of students pursue the accredited planning stream in REM, which uniquely equips these students with additional planning skills and knowledge. This REM program begins with the REM 698 field course, which establishes the importance of collaboration and academic diversity amongst our peers and conveys the multi-disciplinarily aspect of resource management which continues throughout the program and into our future careers.

With that being said, and as with any graduate program, there are areas of the program that could be improved. Firstly, the duration of the program differs considerably amongst students largely due to the varying size and scope of the REM 699 research project. The exact requirements of the REM 699 research project should be made clear before students enter the program so they are aware of what the project entails and how long it will take. Many students do not realize that the program is, in many cases, course-based and thesis-based and the majority of students will take two and a half years at minimum. This should be clearly stated from the outset and measures should be taken to help students complete the program after two years of study. Potential solutions could involve standardizing the REM 699 project requirements and expectations, as well as improving the student/supervisor relationship to be well established, interactive and consistent. An additional factor likely contributing to the slower graduation rate is a lack of funding. As a graduate program, many students anticipate some form of funding for the duration of the program. It is important for all students to be aware of the funding situation for students and what they can expect. Due to a lack of funding, whether from the REM program or a student's supervisor, the majority of students opt to seek additional work outside of their REM 699 project to ensure their financial wellbeing thus delaying program completion. Secondly, REM 801 has been improved in its direction and focus, however, students would receive greater value from this course once their REM 699 project has been more defined. This reiterates the importance of establishing a strong student/ supervisor relationship from the beginning of the program ensuring that REM 699 projects are discussed and a clear direction is defined by the time second semester begins.

There is an inconsistency of some courses being offered that leads to uncertainty when completing program requirements and the potential to miss out on special topic courses of interest. Students have noticed a lack of special topic courses that are offered on a regular basis such as quantitative analysis and field courses. Furthermore,

core courses taught by multiple professors should have standardized and consistent course content. Potential solutions could involve clearly identifying core courses that are offered each year and maintain the frequency that special topic courses are offered and communicate this to students through the REM website. Given the importance of Geographic Information Systems (GIS) experience needed in the resource management field, a dedicated GIS specialist, more accessible GIS resources, and/or a stand-alone GIS course would be helpful. It is understood that these issues are being addressed with new faculty positions and that is a positive step toward maintaining the diversity of courses offered.

There will always be areas to improve on and REM has been diligent in addressing issues in the past and we are sure that will continue. REM has evolved through time to become a well-respected program and all REM students agree that the quality of education and the experience they gain through the M.R.M. program is a positive one. The M.R.M. students recognize that addressing issues takes time and we appreciate all of the work that has gone into making REM what it is today and expect that the program will only improve in the future.

Ph.D. Program

The REM Ph.D. program was established in 1994 to provide students an opportunity to pursue high-level research in natural resources and environmental management. Since then we have graduated 27 Ph.D. students and there are currently 33 Ph.D. students in the program. The REM Ph.D. is intended to be a truly interdisciplinary research degree as students must take core courses in environmental science, ecological economics and public policy, and also demonstrate the breadth of their knowledge in these fields in a comprehensive examination. Furthermore, their Ph.D. thesis must incorporate at least two of these subject areas and their supervisory committee must include expertise in at least two of these areas. We have attracted outstanding students to our PhD program and the research they produce is excellent.

Educational Goals for the REM Ph.D.

The (proposed) educational goals for the Ph.D. program are set out in Table 11.2.

Table 11.2 Educational Goals for the REM Ph.D. Program

Category	Educational Goal	Components/Definition of Educational Goal
Knowledge and Understanding	*Interdisciplinary knowledge and understanding (breadth)*	Knowledge and understanding of key concepts in three core academic fields relevant to resource and environmental management – environmental science, ecological economics, and public policy/planning – and the ability to apply these concepts in the context of the research topic selected for the PhD thesis
	Disciplinary knowledge and understanding (depth)	Deep and systematic understanding of theories and methodologies in the specialized field of study selected for the PhD research, including the relationship of this field to other relevant disciplines
Performance and Practice	*Research skills*	The ability to conduct independent and original research and analysis at the forefront of the field of study selected for the PhD research The ability to select and apply appropriate methodologies for inquiry and analysis (the collection, management, evaluation and interpretation of data) The ability to write a high-quality thesis that advances knowledge and includes research that applies knowledge, theory and methods from at least two of the three core academic fields (environmental

		science, ecological economics, and public policy/planning)
	Communication and engagement skills	▯ The ability to present information (e.g., research and results) and communicate effectively orally and in writing in a variety of contexts to diverse audiences and in interdisciplinary settings
	Ethical awareness and application	▯ The ability to describe and contrast ethical perspectives related to resource and environmental management ▯ A critical ethical dimension to the student's own academic practice
	Leadership skills	▯ The ability to participate effectively in, and lead, multi-disciplinary research teams and other groups
Cognitive Skills	*Creativity and innovation*	▯ Creativity and innovation in analyzing problems in resource and environmental management and designing research and other strategies to address these problems
	Critical thinking	▯ The ability to critically evaluate different conceptions of the goals of resource and environmental management (e.g., multiple-use, sustainable development, resilience)
		▯ The ability to critically evaluate theories, research methods, models and approaches in

		resource and environmental management (e.g., in reports and journal articles)
		An understanding of how theoretical and methodological approaches, framing and other biases affect the ways in which problems are formulated and evidence is interpreted
	Self reflection and learning	The ability to be independent and self-critical as a learner, to reflect on the student's own functioning and the functioning of others in order to improve practice, and to guide and support the learning of others
	Independence and responsibility	The ability to act autonomously and with initiative and originality in research and problem solving

Mid-Cycle Educational Goals Assessment Report Review

Provided by SCUTL, the Senate Committee on University Teaching and Learning

Unit name: **Resource and Environmental Management** Date: 12 January 2021

This form provides feedback from members of the SCUTL subcommittee that reviews plans and reports resulting from SFU external reviews. Our aim is to provide formative feedback on the work being undertaken to set and assess educational goals for programs at SFU. As the inclusion of SCUTL in the external review process is new, we would appreciate hearing from the unit regarding whether this feedback is helpful so we can continue to revise and improve our process. Please feel free to contact the Chair of SCUTL, Elizabeth Elle, at any time (avplt@sfu.ca).

We found that in order to provide feedback on mid-cycle reports, we needed to also consider the assessment plan produced at the start of the external review process. This worksheet notes where particular elements are present in the plan or the assessment, if they are aligned with the aims of the unit, and the strengths and weaknesses of both the plan and the mid-cycle assessment. SCUTL is working from these guiding principles: assessment plans should be **feasible**, **context-sensitive**, and **assess the program, not individual instructors or courses.**

Stage	Element	Plan	Report	Other Comments/Suggestions
Plan and Prioritize	Who will work on the assessment and why			Not articulated
	Department context provided		Yes – used EGs in development of Strategic Plan & MRM-thesis stream	Clearly there has been a lot of work to update the EG framework and align it with changes the unit is making to programs.
	Plan for engaging faculty		Yes – faculty engagement in refining undergrad EGs at retreat	
	Reasonable timeframe	All direct data collection for undergraduate program scheduled for 2 semesters, grad program in 1 semester – may be ambitious		It can be helpful, depending on your goals, to only assess a subset of the EGs in any given year with the goal of examining all ~twice over the 7 year cycle. It might be helpful to focus efforts on EGs that are of particular interest to REM at this time.

Define and Refine	EGs are broken down to measurable sub-goals	Yes		Much of this alignment work was done as part of the mid-cycle report.
	Revise EGs (if unit deems necessary)		Yes	
Curriculum Mapping	Identification of key courses that address specific EGs	Yes	Yes –core course analysis.	REM is now considering if students can meet EGs using only the core courses, not electives. This is an interesting and useful way to consider EGs.
	Curriculum mapping plan (e.g. Introduce/Develop/Proficient; instructional strategies; assessments)	Yes – plan indicates courses that align with EG, though not to what degree. Unclear whether plan includes all courses, or select courses.	Yes – at least twice, to identify gaps in course offerings.	
Assess and Discuss	Specific direct, course-based evidence of student learning as linked to particular EGs	Indicate courses to look at, though unclear which assessments.		Table indicates REM is looking at grades – may not be the best measure of attainment of EGs. The unit may achieve better insight by looking at particular samples of student work or even considering only specific components of marking rubrics. This should help identify areas of strength and potential improvement.
	Feasible plan for collecting additional data (indirect evidence), if needed	Yes, though would caution the use of course evaluations as a measure of EGs.		Capstone is included under indirect – we would have thought this was direct evidence?
	Rationale for data collection, including alignment with EGs. Analysis plan is clear and feasible.			In report, data collection appears limited to curriculum mapping
	Plan to share findings within unit			Not yet articulated
Implement Improvements	(Provisional) Plan for using findings		Yes – plan to use mapping exercise for core courses to review course offerings	

Strengths: REM is quite thoughtful about the curricula of their programs and their work in mapping is very good. There is clearly a commitment to using EGs to review and revise curriculum and course offerings. It's notable that EGs were used to inform the strategic plan, and that undergraduate EGs were revised and EGs were used to guide development of the new MRM thesis stream.

Weaknesses: The analysis focusses on mapping, not either the direct or indirect evidence indicated in the plan, and it's not very clear what the department would like to know and do.

Recommendation: The next step will be designing a way to assess student achievement. This does not need to include every course, but should instead be focused on what you might most like to understand. It would likely be useful to focus on the Capstone, for instance. We encourage you to work with the Specialist, Program Assessment to design a discipline-appropriate way of collecting assessment information that is tractable and useful for you.

If you would like support for re-imagining direct or indirect assessments, please consider contacting Alice Campbell in CEE, who is in a new role of Specialist, Program Assessment (alice_campbell@sfu.ca)