

IRES Self Study

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Prepared for IRES external review
2005-2010

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Executive Summary

The Institute for Resources, Environment and Sustainability (IRES) is a highly successful interdisciplinary research institute with interest and expertise in a wide range of domains specific to the environment and sustainability. IRES is both interdisciplinary (integrating knowledge from different disciplines) and transacademic (interacting with the broader society) and aims to provide decision making support on local and global scales. IRES's outstanding faculty members successfully bring in external funding, publish in internationally recognized academic journals and run collaborative projects with partners in various faculties across campus, with other universities and with non-academic partners.

IRES is home to a major interdisciplinary graduate education program —Resource Management and Environmental Studies (RMES)— with eighty doctoral and forty master's students. The program attracts an international student body drawn to the program by its curriculum and the collaborative research typical of its faculty. During the past five years, 114 students have graduated from the RMES program. A curriculum review was initiated in the spring of 2010 to be phased in during 2010-2011. Its aim is to design a combination of required and elective courses that facilitates staying true to the unit's mission, to encourage students to boldly enter emerging fields and to maintain a sense of flexibility and openness while providing a rigorous and research-centric educational experience.

IRES plays a central role in sustainability-related research and education at UBC, with affiliated students and faculty engaged with these activities across the campus. The University's new strategic plan, Place and Promise: The UBC Plan, launched in the spring of 2010, places sustainability among its four core pillars and IRES faculty members have been deeply involved in the development of that pillar.

IRES was created in 2002 through the merger of two successful units (the Institute of Resources and Environment, or IRE and the Sustainable Development Research Institute or SDRI). The academic team has changed considerably since the unit's inception through the arrival of eight new faculty members and the retirement of four, including the retirement of the former director.

Going forward, IRES needs to:

- support the development at UBC of a well-functioning organizational home for innovative interdisciplinary units that conduct research and education across several Faculties;
- engage in the university-wide dialogue to ensure that UBC's new budget model under consideration supports the kind of bridge-building and collaborative work that characterizes IRES;
- continue to engage with a number of new and emerging interdisciplinary initiatives at UBC (University Sustainability Initiative, or USI), Public Policy School, new graduate programs, etc.;
- Identify the conditions that will allow its faculty and graduate students to continue to collaborate at the highest level;
- find creative ways to provide financial support for incoming students;
- provide its graduate students the opportunity to teach at the undergraduate level
- find creative ways to secure twelve to fifteen faculty appointments; and
- solidify and stabilize its newly formed governance and administrative structures (processes, procedures and routines);

Introduction

This self-study is produced as a component of CFIS' standard procedure of carrying out an external review at the end of a director's term. The report is written for the external review process as well as to support the incoming director; it also is intended to support the unit as a whole in its future strategic development.

The report starts with a brief overview of IRES's history (Chapter 3). The unit is comparably young in that it was created as late as 2002 through the merger of two units (IRE and SDRI), but its roots go back to the creation of the Westwater Research Centre in the 1970s.

Chapter 4 outlines the unit's vision and mission statements, which were created in 2005 and guide strategic decisions such as faculty hirings and curriculum changes.

Chapter 5 gives an overview of the unit's reputation and provides some statistics on publication rates, citations, external awards and student recruitment, which demonstrate that IRES's per capita productivity is among the highest for units/departments in UBC.

Chapter 6 describes the composition and background of faculty members (core and associates), tenure flow, and hiring and retention strategies.

Chapter 7 describes the research conducted in the unit and the five major domains in which IRES scholars and students presently conduct research: Natural and Technological Hazards; Ecosystems, Biodiversity and Resources; Science and Policy for a Global Environment; Equity, Vulnerability and Environmental Change and Innovations in Sustainable Practice. An overview of each of the core faculty member's research focus is provided in an appendix, as is their full CVs.

Chapter 8 outlines the teaching conducted in the unit with the highly competitive RMES program as the unit's centre piece. The chapter also describes the teaching conducted by IRES faculty members in other units, with three faculty members engaged in the professional program provided by the School of Regional Planning and other faculty members engaged in undergraduate teaching in the Environmental Science Program in the Department for Earth and Ocean Sciences and Conservation Biology at the Faculty of Forestry.

Chapter 9 speaks about IRES's approach to interdisciplinary research and education and the strategies IRES applies to secure and facilitate advanced interdisciplinary studies of high quality. Chapter 10 discusses diversity and the fact that intellectual and cultural diversity, in a wide sense, are cornerstones of successful interdisciplinary research and education related to environmental issues and sustainable development.

Chapter 11 describes the process leading to the evolution of a new governance structure for IRES and the RMES program and outlines the core elements of the present structure. Chapter 12 describes the challenges facing the administration of a complex unit like IRES and the process of developing an administrative structure that meets the unit's needs. Chapter 13 outlines the unit's financial situation, its general purpose operation funding (GPOF), and its external grants.

Chapter 14, finally, summarizes strengths, weaknesses, opportunities and threats and outlines both challenges that need to be addressed and thoughts of the future .

Brief History

The Resource Management Science interdisciplinary graduate program was created within the Faculty of Graduate Studies on September 1979 (chaired by Dr. Les Lavkulich, Appendix 1). The initiative's objective was to foster interdisciplinary graduate research and education/training in integrated resources management at UBC. Over the next decade, the graduate program grew from an initial five students to approximately thirty students. In 1990, the Resource Management Science program was renamed Resource Management and Environmental Studies (RMES) to better reflect that the program offered both M.A. and M.Sc. degrees.

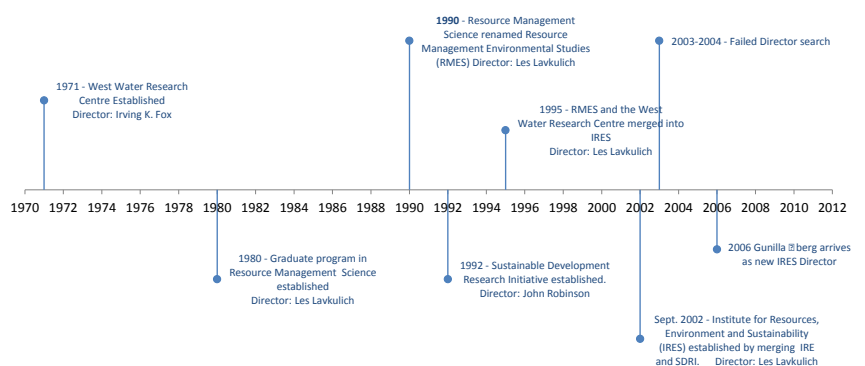
In 1995, the Institute for Resources and Environment (IRE) was created with Dr. Les Lavkulich continuing as director. By this time, the RMES program had grown to about 60 students and IRE had six core faculty members. IRE was created by joining the RMES program with the Westwater Research Centre, which had been created in the 1970s in response to a Canadian government initiative to encourage the setting up of a number of interdisciplinary water resource research centers in Canada. The main strengths of the centre seem to have been its first-class applied research on issues related to water resources, according to its [1992 external review](#). Water remains a focal area for research in IRES.

In 2000-2001, the Dean of the Faculty of Graduate Studies proposed a merger of IRE with the Sustainable Development Research Institute (SDRI). The SDRI had been created in 1992 with the aim of fostering research on sustainable

development issues that were policy-relevant and interdisciplinary and involved non-academic partners. In its research, the SDRI (with Dr. John Robinson as founding director) emphasized the linkages between environment and development issues, the increasing importance of environmental issues in the decisions of governments and industry, and the need to connect environmental imperatives directly to economic and social priorities. The rationale for merging the two units was that both dealt with environmental and sustainability issues, but while the IRE's strength was in the natural sciences, SDRI's strength was in the social sciences and humanities. The two units thus complemented each other and would, as a joint unit, be uniquely positioned to become a leader in research and graduate education in areas dealing with the interaction among natural and human systems. In September 2002, SDRI and IRE merged to establish the Institute for Resources, Environment and Sustainability (IRES) with Dr. Les Lavkulich as director.

The transition period that followed involved the amalgamation of quite different academic cultures with some attendant challenges, as pointed out in [IRES Self Study](#) as well as the 2003 External Review (Appendix 2). The amalgamation was slowed down by a failed director search in 2003-2004 and the retirement of the founding director in 2004. [A new vision and mission statement](#) was developed concurrent with a [joint strategic plan in 2005](#) under the leadership of Acting Director Tim McDaniels. A second director search was initiated in 2005 and resulted in the arrival of Dr. Gunilla Öberg in October 2006.

IRES Timeline



As demonstrated further on in this report, the unit has developed into a healthy, collaborative and highly productive unit, which has grown considerably to thirteen faculty members, and a total of sixty students to forty master's students and eighty doctoral students.

IRES's organizational place in UBC

IRES is one of several interdisciplinary units that comprise the College for Interdisciplinary Studies (CFIS). One of the major challenges for CFIS has been its double mandate to facilitate interdisciplinarity across campus and function as an organizational home for its units. Another major challenge has been its unclear and possibly inherently unstable position as a college rather than a Faculty. The report from the external review team was recently released. IRES supports the External Review Committee's proposal to initiate an inclusive and transparent process with the aim of creating a new organization, which functions as a home for IRES and other interdisciplinary units. In our view, UBC needs an organization that is able to provide adequate support to units that conduct innovative and non-traditional research and education in complex areas of topical societal concern, such as environment and sustainability, that 1. require engagement by faculty members from a variety of disciplinary as well as nontraditional backgrounds, 2. span competencies of several Faculties whereby interdisciplinary collaboration is also the core of that cross-faculty engagement, and 3. work in close collaboration with partners outside academia.

The departments that comprise traditional faculties, such as Arts, typically rest on a specific disciplinary canons that guides the perception of what entails high quality research and education, which in turn colours the assessments for promotion and tenure, curriculum contents and the assessment of graduate student work etc. If placed, there-

fore, in a traditional faculty, IRES would likely be pressured to transform into something considerably less unique than it is today, not least because the faculty members would be forced to conform to institutional habits rooted in those traditions.

Being positioned in an interdisciplinary faculty that embraces an inclusive but rigorous approach to research and education makes it possible for IRES to navigate the very different and sometimes incommensurable epistemological perspectives and disciplinary views on academic quality that prevails in the academic community, and thus collaborate with very diverse partners. It also provides the opportunity to develop and apply interdisciplinary criteria of evaluation of research and teaching. This is crucial for the career path of faculty and grad students in the RMES program.

One of IRES's key strengths is that it attracts outstanding students with very diverse backgrounds who wish to pursue advanced interdisciplinary studies, and who often integrate theories, methods, concepts, models and thought styles from various disciplines in an unorthodox manner. The strength of a non-traditional organizational home like CFIS is it is not tied to specific disciplinary, epistemological or sector-bound frameworks and criteria. It is consciously a very inclusive approach. No-one is consequently discouraged from applying due to the identity of the unit's organizational home.

Vision and Mission Statements

During two strategic planning sessions in November, 2005, IRES achieved consensus and organizational commitment to new vision and mission statements. These remain the organizing and operational principles for IRES in 2010.

Vision statement

IRES vision is to *Foster sustainability in human and natural systems*. This vision fits with the Institute's past, present and future, and is in keeping with sustainability as a major theme for research and teaching at UBC. This vision is unique and innovative in its emphasis on linking both human and natural systems, and with its systems orientation.

Mission statement

The mission of IRES is to foster sustainable futures through integrated research and learning about the linkages among human and natural systems to support decision making from local to global scales. The IRES mission is elaborated and specified further in the following points that explain what aspects of the mission statement mean for IRES.

Fostering sustainable futures

- Requires integrated learning with relevance to real world problems;
- Involves linkages with partners in civil society as a basis for social engagement; and
- Uses interdisciplinary and transacademic approaches that integrate natural, social, policy and decision sciences.

Learning within IRES occurs through interdisciplinary and transacademic excellence in:

- Research to create new knowledge about socially significant and environmentally pressing questions;
- Graduate education for professional and academic research training; and
- Public service to foster societal knowledge and practice.

This mission statement defines for IRES a specific direction that complements the missions of other units at UBC, including the overall mission of CFIS and of UBC, as articulated in the 2010 strategic plan Place and Promise: The UBC Plan. The plan places sustainability at its heart with the Sustainability Academic Plan and the creation of the University Sustainability Initiative (USI). The UBC plan emphasizes integrated research and learning, which means, in IRES's view, an integration across multiple disciplines, multiple theories and methods, multiple perspectives, multiple kinds of understanding, and multiple scales of inquiry. The mission situates IRES as an institute that aims at being a nexus for research and teaching that addresses integrative methods, transacademic and interdisciplinary perspectives, linkages among human and natural systems, and policy relevance.

Reputation

IRES enjoys a very strong reputation for conducting high quality interdisciplinary research and providing a creative, stimulating and collegial environment for its students, visitors and faculty members. As seen in the CVs (Appendix 24), the faculty members are often asked to act as experts on various panels and to give keynote lectures. They also serve on boards, are members of think-tanks, participate in the public debate and are actively engaged in UBC’s strategic development.

The research quality, for example, is demonstrated in the number and quality of publications (see below) as well as in the amount of external funding the faculty members successfully brings in through competitive grants (see Chapter 14, Financial resources/External grants). Other indicators of the unit’s reputation are the number of students who apply for admission to the RMES program and how well the students manage after completing their degrees.

Publications

IRES’s faculty members as a group have a high publication rate and publish in internationally high ranking journals. The thirteen core faculty members jointly produced over 320 publications during 2005-2010, of which over 240 were published in the peer-reviewed literature. Four were

published in journals with an impact factor over twenty-five (Nature, Science and Nature Nanotechnology) and 90 papers were published in journals with an impact factor over two (Figure 1). Many of the publications are widely read, which is illustrated by the fact that thirty-five articles published between 2005 and 2010 have already been cited ten times or more.

Number of applicants to the RMES program

Another sign of the unit’s reputation is the number of students applying to the RMES program. About 120 students have been applying to the RMES program between 2005 and 2010 and only fifteen to twenty have been admitted. Most of the professors receive several requests per week throughout the year. As admission deadlines approach, often several requests are received per day; the agreed-upon policy is to clarify to potential applicants that the competition is fierce and that only very promising students are admitted. This policy seems to have decreased the number of non-eligible applicants, but the total number of students applying has not decreased. Entrance interviews with the students reveal that they most often have found the program through one of the professors’ reputations or through internet searches for interdisciplinary graduate programs.

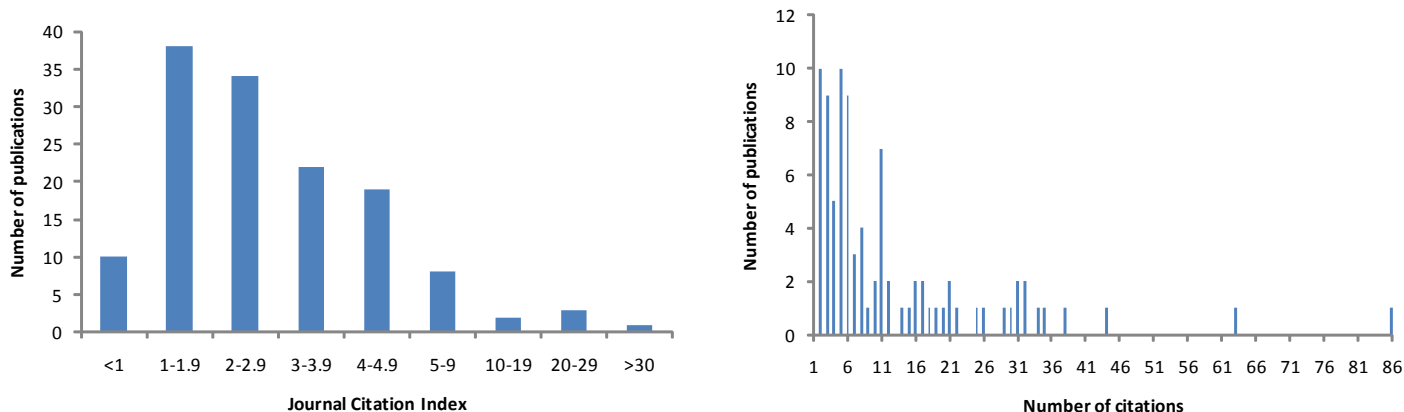


Figure 1. The diagram to the left shows the citation index for the journals where IRES’s faculty members have published. The diagram to the right shows number of citations for these publications. (Citation data from ISI Web of Knowledge, accessed November 2010).

Faculty

Goals

The goal is to attract and retain highly qualified and collaborative faculty members with complementary scholarly competencies who wish to foster sustainable futures and are deeply dedicated to providing an outstanding graduate education. The unit strives to

- retain its highly qualified faculty members
- increase the number of core faculty members to 12-15 members who are actively engaged in the unit's internal affairs in order to create a sustainable work-load with regards to internal service;
- retain and attract thirty to forty highly qualified faculty associates from a variety of relevant units/departments across campus and ensure that they are actively engaged in research and education; and
- attract highly qualified visitors and postdoctoral fellows from around the world who collaborate closely with faculty members and students in the unit.

Core faculty members

IRES has thirteen core faculty members with complementary competencies (Appendix 3). Many of the faculty members are jointly appointed with other units and departments across the UBC campus (Appendix 4). IRES faculty members work in various interdisciplinary settings with colleagues from across the UBC campus and other universities in Canada and elsewhere. They also collaborate with industries, interest groups and governments in society and play a central role in UBC's new sustainability initiative. Their research interests cover areas such as societal resilience to natural disasters, eco-hydrology, sustainable buildings, energy systems, the water-energy nexus, risk

perception and values, urban sustainability, ecosystem services and decision making.

There are presently two Assistant Professors, three Associate Professors and eight Full Professors in the unit distributed over 8.48 full time equivalents (Appendix 5).

Faculty Associates

In addition to the core faculty members, IRES has thirty-three faculty associates in eight of UBC's Faculties (Appendix 6). According to UBC policies, an associate member is "an unofficial position given to a UBC faculty member when there is a need for members of one department to have a formal arrangement to participate in teaching and research activities in another department, but when a joint appointment is not necessary."

IRES faculty associates are nominated by an IRES faculty member and voted on by the faculty. The faculty associates play a special role in IRES compared to in many other units. Fifty-two percent of the graduate student population are supervised by advisors from other departments. Some faculty associate members have a large number of graduate students in the institute, while others supervise only one or a few students. Hence faculty associates are crucial for the role they play in supervising the interdisciplinary graduate students in the institute. To be eligible for "associate" status, faculty must first have served on a student supervisory committee. In addition, IRES faculty members can nominate a faculty member to be an associate given their own prior experience with the potential supervisor. A faculty associate is initially given terms of two years as a trial period to develop and assess the working relationship

between IRES and the associate. After the initial trial period, a faculty associate may be appointed for three years. Since 2009, faculty associates can apply to be accepted as core faculty members, a status that allows them to participate and vote in IRES's Management Meeting. A number of faculty associates have expressed appreciation for the openness demonstrated by IRES through this changed policy and have indicated that they are considering the opportunity. At present, only one faculty associate (Hisham Zerriffi) has applied and been accepted as a core faculty associate.

Mentoring and promotion of junior faculty

Each junior faculty member is assigned two mentors. In addition, the director meets with each faculty member once a year to discuss career progress and the potential need for additional support. Junior faculty members are encouraged to co-supervise and co-teach with more senior colleagues.

Quality of intellectual life for unit's faculty

As indicated by their CVs, the core faculty members are very active. They participate in and run numerous networks, and interact with each other, their students, post-doctoral fellows, visiting scholars, other faculty members across the UBC campus and other academic institutions. The director meets with each faculty member once a year to discuss the present situation and future plans. These conversations have revealed that IRES faculty members

treasure the interaction with IRES's creative, inquisitive and highly qualified students. Most IRES faculty members collaborate with one or several others and express a desire to increase this type of collaboration. The major challenge to the individual faculty member's intellectual life is that they have a tendency of over-committing and thus often feel as if there is insufficient time for reflection and recovery.

Career stage distribution and tenure flow

The career stage distribution during 2005-2010 is given in Appendix 5. Before 2004, the unit was very 'top-heavy'. The hires done since 2003 has somewhat remedied this situation.

Stephanie Chang was promoted to full professor in 2009, and, effective July 2010, Kai Chan was granted tenure and early promotion to associate professor.

Visiting scholars and post-doctoral Fellows

IRES continually receives requests from visitors from around the world who wish to spend time in the unit. Anyone who brings his/her own funding, conducts research in a relevant field and has a champion among the faculty members is welcome. Until summer 2010, the unit was able to provide office space for all who fulfilled these criteria, but lack of space has made it necessary to decline two requests in the fall of 2010.

Recruitment and retention

The mission statement has been used to guide decisions about hiring and retention priorities. Below are listed the hiring and retention efforts 2005-2010. First, a short description of how IRES's core values have been used as a means of identifying aspects of the job descriptions. Factors that have been considered in decisions about hiring and retention:

- The sequential nature of hiring and retention decisions. The merits of a given candidate in a given hiring effort depend in part on who has already been hired in previous recruiting efforts. Hence, instead of laying out a firm sequential plan over a long period of time, the plan has been continuously updated.
- Securing a broad range of candidates.
- Capabilities within the faculty at present (core and associates). How best to augment those capabilities to achieve the unit's mission has been carefully taken into consideration with each hiring.
- Ways to augment faculty capabilities other than hiring full-time faculty members. These include partial appointments or term appointments with highly capable people who fit with the unit's mission and priorities and are already at UBC or in the area.
- The demographics of the faculty in IRES. There was clearly a need to hire junior faculty who would be here for many years, and who would be capable of taking on major leadership responsibilities in the next five to ten years.
- Balance between natural sciences, humanities, social sciences and engineering.
- The future of water-related research. This was one of the key foundations of IRES since its inception, through

the Westwater Research Centre. Three of the four faculty who had retired had been the basis for the water resources emphasis in IRES.

New director

As mentioned earlier in the document, a new director search was initiated in 2005 and Dr. Gunilla Öberg was recruited from Sweden, and assumed office in October 2006.

Water and sustainability

In 2006, there were three vacant positions, which all were joint appointments. This meant that IRES did not have full power over any of the positions. In November 2006, a letter was sent to the Dean's office for forwarding to the Provost, making a reasoned case for retaining the three vacant positions and arguing that an f-slot should be created for the director's position (see Appendix 7). The letter led to two meetings with the acting dean (later CFIS's principal) and the provost. With strong support from the CFIS's Principal Grant Ingram, successful negotiations in June 2007 led to the right to fill the positions, in spite of a recently announced hiring freeze at UBC. IRES was allowed to keep the turn-over savings on the first position, provided the person hired would teach one course in Earth and Ocean Sciences (EOS). After careful discussions during the spring of 2008, drawing on the strategic considerations mentioned above, a search was initiated in the fall of 2007 in the field of Water and Sustainability (see Appendix 8). The call led to eighty-seven applicants, references were checked for eight, and three of the eight were called for interviews. The position was offered to Mark Johnson, who started in IRES on July 1st, 2008.

Human dimensions of environmental change

Continued negotiations with the Principal's Office and the Provost Office led to the decision that the unit would also be allowed to keep the turn-over savings of the second position. Since both Johnson and Öberg are more rooted in the natural sciences, it was agreed that the third position was to be filled by a scholar rooted in the social sciences and humanities (but with demonstrated experience of working with 'the other side'). Continued discussions led to the advertisement of a position in "Human dimensions of environmental change" in September, 2008 (see Appendix 9). The call led to 156 applications, references were checked for eight, three of these were called for interviews, and, after lengthy discussions, the position was offered to Leila Harris in the spring 2009, who accepted with the start date of January, 2010. During the negotiations, IRES was approached by both the Centre for Women Studies (CWAGS) and the Department for Geography, who requested that IRES consider the possibility of a joint position. The Department of Geography eventually pulled out due to lack of funding, and IRES accepted the offer from CWAGS after consultation with Dr. Harris.

Retention through spousal hire

The unit was allowed to merge the 'left-over' one third from Harris' position (created by the CWAGS contribution) with the share in the remaining vacant position (twenty percent of which was in IRES). At this time, the unit was not allowed to keep the turn-over savings, so the combined slot amounted to only two thirds of a position. After several attempts to transform the two-thirds position to a full-time position (by seeking potential joint appointments,

endowments, etc) had failed, it was unanimously decided at a faculty meeting in January, 2010 that the two-thirds position be donated to CFIS for a spousal hire, which would make it possible to retain a highly valued faculty member who was offered a prominent position at another university. Based on the need to increase rather than decrease the number of faculty members (see "retaining a sustainable size" below), a strongly expressed wish was forwarded to CFIS that the Principal's office do its utmost to find a way to get a full position back to IRES.

Technology innovation, human development and the global environment

Dr. Milind Kandlikar has, since his arrival to UBC in July, 2002, been a very active faculty associate of IRES, supervising students, serving on committees and participating in various joint research projects. He has been jointly appointed with the Institute for Asian Research (IAR) and the Liu Institute for Global Issues (LIGI). Discussions have been ongoing since at least 2004 about moving part of his position to IRES. The fact that Dr. John Robinson stepped in as executive director of the newly created UBC University Sustainability Initiative (USI) in the spring of 2010 led to a CFIS decision that IRES would be compensated with 75,000/yr for six years. Successful negotiations led to the result that these funds were used to move fifty percent of Milind Kandlikar's position from the Institute of Asian Research (IAR) to IRES. IRES is working jointly with CFIS on a strategy that would allow the unit to keep Kandlikar after the end of those six years.

Research

IRES faculty and students conduct research on a wide range of environment and sustainability issues of contemporary concern, often relying on integrated, qualitative and quantitative analyses of human and natural systems. The research domains of water and energy, which were major emphases within the founding units, remain active research areas as illustrated by recent hires. The research is often conducted in close collaboration with stakeholders and partners – from local enterprises and decision-makers to governmental bodies, NGOs and international businesses. Research presently conducted at IRES is, in one way or another, related to governance, decision making, risk analysis or the interaction between science and policy. Below is a summary of the major research domains indicating the contributions of core faculty members, faculty associates and recent graduates who are active in each domain. An overview of the research currently conducted by IRES core faculty members is given in Appendix 24, followed by individual CVs. The graduate students' research topics are summarized in the chapter on teaching; each individual thesis title is given in Appendix 10-12.

Goal

IRES's goal is to conduct research of highest quality in emerging areas of contemporary concern in any field that is relevant in light of IRES's mission statement. With respect to quality, the unit aims to produce research that has a high impact in the academic world, that is useful for society, and that provides an outstanding learning environment for graduate students. Progress toward this goal is constantly reviewed as the unit carries out strategic discussions to specify and re-define what it means to connect research to curriculum and graduate training.

Research domains

With an emphasis on climate change, energy and/or water, IRES's five major research domains are:

Natural and Technological Hazards

Studies dealing with society's vulnerability and resilience to natural hazards such as earthquakes and related tsunamis, droughts and flooding as well as the perception of risks in relation to new technologies such as nanotechnology and GMOs

Ecosystems, Biodiversity and Resources

Studies dealing with ways to integrate the ecosystem services concept into decision-making at different levels of society and to improve the identification and management of protected areas in both marine and terrestrial environments.

Science and Policy for a Global Environment

Studies dealing with energy markets and implications for climate policy, vehicle legislation and regulations, energy policy and outdoor air quality, health impacts, water governance, and the impact of land-use practices on the carbon cycle and the emission of green house gases from terrestrial environments.

Equity, Vulnerability and Environmental Change

Studies dealing with impacts of global change (access to water, land, food and sanitation, changes in air, water and food quality, etc.) on societies and specific groups, for example the distribution of risk or differentiated understandings of changes based on socioeconomic status, gender or ethnicity, as well as the impact of change on vulnerable groups and the distribution of power.

Innovations in Sustainable Practice

Studies dealing with innovative ways to retrofit communities and organizations to reduce GHG emissions, energy consumption, water use, traffic and the impact on ecosystems while increasing the well-being of inhabitants. The studies are conducted on various scales from buildings and individual enterprises to neighborhoods, cities and regions.

Teaching

The centre piece of IRES is the RMES program, which is a major graduate program at UBC. The teaching conducted by IRES faculty members is thus dominated by undertakings related to the RMES program as faculty members teach courses, supervise, and sit on supervisory committees and other committees related to the graduate program (admission, awards, curriculum etc). In addition, IRES faculty members teach both graduate and undergraduate classes outside the RMES program. This is true particularly for the faculty members who have joint positions, such as the three faculty members (Chang, McDaniels and Dorcey) who have joint appointment with the School or Regional Planning (SCARP), which provides a certified professional degree in planning and requires faculty members to carry a significant teaching load. Appendix 13 outlines the courses taught by IRES core faculty members and Appendix 14 outlines the units and departments outside IRES where they teach courses or supervise students.

The RMES program

The Resource Management and Environmental Studies program is one of UBC's largest graduate programs with approximately eighty doctoral students and forty master's students. The program is highly competitive with an admission rate of about twelve percent. It attracts highly qualified students from across Canada, as well as from various countries around the world. The unit admits promising students in any area that fits with the mission statement, provided that it is possible to provide supervision. Consequently, the topics are highly varied, which here is illustrated by the thesis titles of students who have graduated in the RMES program 2005 to present (Appendix 10-12). During the period of 2005-2010, 114 RMES students successfully graduated, of which forty-eight earned doctorate degrees, sixty-five become Master's of Science and seventeen became Master's of Arts.

Goal

To provide an outstanding learning environment that stimulates graduate students to enhance their critical thinking and analytical capacity, hone their methodological skills and increase their ability to identify, gain and apply relevant knowledge in support of decision making, under the umbrella of IRES's research goals, as formulated above.

Admission and recruitment

Attracting highly qualified students has benefited IRES enormously in terms of training, ambition and research commitment. The unit requires an eighty percent grade point average, or 3.7, from incoming students, along with strong letters of reference and a well-considered and well-written thesis proposal. These admission criteria being as they are, the unit admits roughly twelve percent, during any given annual admissions cycle. A large number of students contact faculty members ahead of the admission deadline, and even though weak applicants or applicants with interests outside the scope of the program are discouraged, the program still receives about 120 applicants each year. The number of applicants, in combination with the fact that the program requires a proposal, and that only fifteen to twenty of the applicants are admitted, makes the admission process time-consuming. To facilitate and ensure fairness in the admissions process and to ensure admission of students with the highest likelihood of success, a process was initiated to develop and document policies and procedures for the admission of students to the RMES program (Appendix 15). The new website <http://www.ires.ubc.ca> (launched in 2010) has dramatically increased the ability to communicate with prospective students.

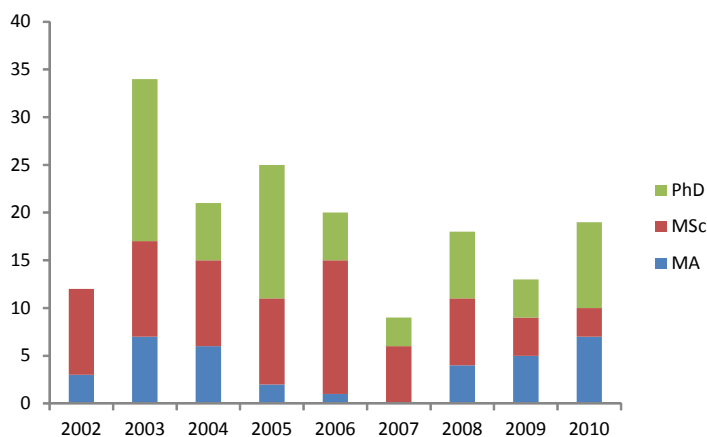


Figure 2. Number of students admitted to the RMES program since 2002

Time to completion

The average time to completion for students who have defended between 2005 and 2010 is 3 years for masters students and 5.75 years for doctoral students.

TAships

Since IRES has no undergraduate degree program and previously had few formal ties to undergraduate teaching, the lack of opportunities to gain teaching experience (and an extra funding source) has continued to be a major problem for the RMES program. Through negotiations with EOS in relation to the creation of Mark Johnson's position and Kai Chan's collaboration with EOS, IRES has secured at least two TAships per year in EOS¹. Collaboration with Applied Science, Science and Arts in relation to the newly developed course² led to three more TAships being secured for

students in the RMES program, provided that IRES continue to take responsibility for the course. A few additional students are able to secure TAships through other channels. The situation is better than in previous years, but the unit needs to further develop contacts with undergraduate programs with the aim of providing the opportunity for the majority of the RMES students to obtain teaching experience while studying in the program.

The Professional Development Series

A group of RMES students initiated a professional development seminar series (see Appendix 16), which received high praise within and also outside the student body. Through negotiations with CFIS in 2008, the Director secured ten thousand dollars in funding for the administration of the series, which, according to the contract with CFIS, is to be run by one or several RMES students. In addition to being an additional income source for one or two students, the series seems to have been quite successful and to have helped students to be better prepared for life after graduation.

Present student body

Fifty-four percent of the present RMES student body consists of international students. The RMES program prides itself on its international reputation, which is evidenced in part by the fact that the majority of the students hail from an international background. The origins of students enrolled in the RMES program are illustrated in the maps provided in Appendix 17.

1 The TAship structure at UBC is such that twelve contact hours represents a full-time TAship. The TAships mentioned above each consist of approximately four contact hours, which represents a one third FTE TAship during the semester in which the courses are offered.

2 <http://www.sustain.ubc.ca/teaching-learning/applied-sustainability-ubc-living-laboratory-apsc-364>

In addition to the international flavor of the student body, the admissions criteria are set at a higher level than those of UBC itself. The applicants who become RMES students are well-suited to becoming national and international leaders in their respective fields, and this is proven by the RMES student body boasting a Vanier Scholar, a Killam Fellow, multiple Bridge Fellows, multiple patent holders and multiple SSHRC/NSERC and Affiliated Scholarship winners .

Curriculum development

The curriculum has been a central topic of the unit's strategic discussions. A curriculum review was initiated in the December 2009 meeting and the Curriculum Committee (co-chaired by Drs. Dowlatabadi and Satterfield) prepared a proposal, which formed the basis for the strategy meeting in June 2010. A substantive revision of the curriculum was agreed upon, and is now underway (Appendix 18). The new curriculum has a number of new required courses designed to better prepare the student for the challenge in the coming half century. The curriculum structure was also revised both to ensure more timely completion of degrees and provide greater flexibility for those pursuing a research-heavy master's degree or anticipating a PhD. This allows students to either take the master's as a terminal degree and/or design their program with the aim of going on to the PhD.

Student satisfaction

A survey is delivered to each RMES student during every spring. The responses to both the in-person interview as well as the student satisfaction survey have been very positive. The graduate advisor and the graduate secretary have been able to use the information to assist students with individual issues and concerns, as well as hone the RMES graduate advising system as a whole when students raise issues that affect the RMES student body at large.

In addition, each student is required to meet with their full research committee at least once per term. These meetings are then documented on the RMES Committee Meeting Report form and handed in to the graduate secretary to be placed in the student's file. Most student committees meet on a more frequent basis, but this mandatory minimum of meetings helps to ensure that students are getting a sufficient level of attention in order to successfully and productively conclude their research and degree program at RMES.

Alumni

IRES has a proud track record of placing students in prestigious positions within academia, government and industry. In Appendix 19 you will find a sample of recent graduates and the positions they attained immediately upon graduating with a degree from the RMES program.

Undergraduate Teaching

IRES does not have an undergraduate program but the unit is actively participating in undergraduate teaching in various ways. Many of the faculty members are responsible for courses in other departments such as EOS, Geography, and various engineering programs (Appendix 13). The faculty members have also been driving in the strategic development of new and innovative interdisciplinary courses and programs across campus such as the new masters program in Engineering and Public Policy (EPP) which will start in 2012 or the newly launched undergraduate course Applied sustainability – the UBC campus as a living laboratory (APSC 364), which is conducted in collaboration with UBC Planning and Operations and is open for students from six faculties. Three of the units faculty members are joint appointed with the School of Community and Regional Planning (SCARP) which is a certified professional planning program, and they have major teaching responsibilities in that program.

Interdisciplinarity

The IRES mission statement's specific focus on the interaction between human and natural systems to support decision-making has led to IRES to an increasing extent attracting students and faculty members with an explicit interest in interdisciplinary studies across the natural science-social science divide. This development has been amplified by a conscious hiring strategy aiming for complementary rather than overlapping competencies, to ensure that collaborative efforts are not impeded by potential disciplinary based competition (see "Recruitment and Retention" above). Co-supervision and co-teaching are encouraged and counted equal with single-handed supervision. The ongoing curriculum development emphasizes this collaborative approach. The faculty associates, who come from seven of UBC's twelve Faculties, play a key role for IRES, as they represent competencies that are complementary to that of the core group.

Constructive discussions on the opportunities and challenges of interdisciplinary research and education are continuously carried out in seminars and work-shops. Most research projects are initiated through dialogues among the faculty members and one-person ventures are rare; proposals are generally submitted with several co-investigators of complementary backgrounds. IRES faculty members (core and associates), as well as other scholars across the UBC campus and elsewhere, generally make up the teams. Successful projects are generally used to support the graduate students and it is common that IRES faculty members provide funding for each others' students.

IRES has initiated discussions with the Faculty of Graduate Studies (FoGS) regarding a terms of reference for external reviewers, instructions for content and structure of

master's and doctoral theses and the basis for quality assessment of interdisciplinary studies. As a result, IRES has several times been asked to provide feedback on FoGS' policies and guidelines. The unit has added complementary and clarifying instructions and tips in the [IRES Handbook](#) to help students successfully navigate the challenges.

The explicitly stated goal to conduct research and teaching in support of decision making attracts students who wish to support change towards a more sustainable society. The students in the RMES program are encouraged to collaborate with partners outside academia and most students work in close collaboration with one or several organizations from industry, NGOs, local, provincial-, federal and international organizations. The extra academic partners sometimes provide funding for the students and such support is enhanced through support, for example, funding from MITACS³. Many students have already secured contacts with non-academic partners when they apply to the program.

Seminars and workshops are held on a regular basis focusing on opportunities and challenges related to the wish to conduct 'useful' research, thus helping students to develop their understanding of science-policy interaction and take a conscious approach to issues such as engagement, advocacy and activism.

Goal

To provide an intellectually stimulating climate that encourages and supports the creation of bold interdisciplinary and transacademic research and education of highest quality.

³ <http://www.mitacs.ca/>

Intercultural understanding

Intercultural understanding is one of the commitments in UBC's new strategic plan, Place and Promise: The UBC Plan: "The University engages in reflection and action to build intercultural aptitudes, create a strong sense of inclusion, and enrich our intellectual and social life." IRES reflects this goal in that successful interdisciplinary research and education requires that those involved embrace the fact that high quality research can be conducted in more than one way, which, to a large extent, is a question of shaping and fostering respectful attitudes to those who have different perspectives than oneself. Issues related to sustainable development are inherently value-laden, with cultural background, gender, ethnicity, nationality, education and life-experience (in addition to disciplinary training) guiding perceptions and values. These are intimately linked to how problems and their potential solutions are defined. Intellectual and cultural diversity, in a wide sense, are cornerstones for successful interdisciplinary research and education related to environmental issues and sustainable development. Intercultural and interdisciplinary aptitudes are likewise an important part of being successful in IRES research.

During the past few years, principles on how best to take diversity issues into account and whether or not they should be integrated into the unit's governance structure have been topics of discussion in the unit. All agree that intellectual diversity is desirable, but the faculty members are divided on other aspects of the issue, for example, on whether or not other forms of diversity (e.g. gender, ethnicity) are relevant to achieving the unit's mission, to what extent principles of diversity need to be explicitly spelled out in policies, and if procedures and departmental guidelines need be developed to ensure sufficient attention is paid to diversity-related issues. These discussions have led to an increased consciousness with regards to diversity. As a result, national vs. international students, gender and the cohort's disciplinary background are discussed during admissions, awards and hiring processes, and are being taken into account to varying degrees. Below follows a short description of three aspects of diversity: educational background and gender.

Educational background of core faculty members and students

The IRES core faculty members cover a variety of competencies (Appendix 3). Speaking in traditional terms, the groups competencies include natural sciences (such as energy systems, ecohydrology, ecology, ecosystem services, biochemistry, environmental analytical chemistry, microbiology and biochemistry), social sciences and humanities (such as human geography, decision theory, planning, anthropology, sociology, environmental philosophy and science and technology studies) and applied sciences (such as engineering and architecture forestry). From a methods perspective, the group has deep competence in both quantitative and qualitative studies, and they conduct field work, modeling and laboratory based studies. Many projects have a case study approach, which has proven successful in facilitating collaborative efforts across unorthodox combinations of disciplines.

The faculty members have received their training in a broad range of academic institutions, with a dominance of American universities, in particular Cornell University, where four of the faculty members have spent part of their academic careers either as students, postdoctoral fellows or faculty members. Appendix 3 shows the universities where the faculty members have received their undergraduate and graduate training.

Gender

In the present student group, fifty percent of the doctoral students, twenty-six percent of the MSc and thirty-eight percent of the MA students are men whereas nine of the thirteen faculty members (seventy percent) and one out of five of the administrative staff (20 percent) are men. We have recently implemented several gender sensitivity questions as part of our annual check-in with graduate students, and hope to implement other gender and diversity efforts in the coming years.

Governance

Prior to 2005, IRES and the RMES program were run in a 'director-in-consultation' mode with few formalized policies and procedures. The model was highly successful in the earlier days of the program, but the growth of the program both in numbers (of students, faculty members and external funding) and complexity (of supervisory committee compositions, societal partners and funding sources) made the model unsustainable beyond the former director's retirement.

The creation of a formalized governance and support structure was initiated in 2005. A more democratic and efficient structure has slowly taken shape as roles, policies and procedures have been clarified and defined. Bi-annual strategy meetings were initiated in 2007 (two days in June and a day in December) to drive strategic development. These meetings have functioned as major vehicles for identifying and prioritizing issues. By systematically following up decisions made in the strategy meetings, the unit has steadily worked its way through the identified issues, which has resulted in the development and documentation of policies and procedures, which are compiled in the [IRES Handbook](#) and since August 2009 available on the website.

Shared leadership has developed as a cornerstone in IRES's new governance structure, as responsibility has been delegated to the graduate advisor and the standing committees. The collective responsibility for the unit has thus grown in parallel with the creation of policies of procedures and the identification of roles and responsibilities. Individual faculty members have taken the lead in creating policies and procedures. For example, Terre Satterfield led the development of the comprehensive exam policy, Stephanie Chang was in charge of the student review structure and designed the Spring Review and Hadi Dowlatabadi took the lead in creating a document to support students navigating the written format of an interdisciplinary thesis. Also, the chairs of the awards committee (Hadi Dowlatabadi 2007-08, Kai Chan 2009-10, Milind Kandlikar 2010-11) and admissions committees (John Robinson 2008/10, Mark Johnson 2010/11) have taken their roles very seriously and continue to amend the instructions and

procedures and interact with staff members in IRES as well as in FoGS to ensure the process is fair and instructions on websites are correct.

Below follows a description of the roles and responsibilities that underpin the IRES and RMES program governance structure.

Roles and responsibilities

The Director

The director is a faculty member who provides administrative, intellectual, social, and academic leadership to IRES. This includes leading the unit's strategic development. The director is responsible for the well-being of those who are active in IRES and strives to provide a welcoming, generous and intellectually-stimulating climate. Students, staff, faculty members or visiting scholars who have concerns are encouraged to request a meeting with the director, who takes appropriate actions in response to concerns.

The director also

- Maintains a continuous dialogue with the CFIS Principal's Office;
- Liaises with Faculty Relations, the Equity Office and other UBC units;
- Chairs the Management Meetings and the Faculty Meetings;
- Meets annually with IRES core faculty members to discuss their work load and future plans;
- Meets with representatives from the RMES Student Society three to four times per semester to ensure that student initiatives and concerns are heard;
- Meets weekly with the administrative manager to ensure that the administration functions efficiently and meets IRES's needs; and
- Meets once per semester with IRES graduate advisors, Fisheries director and the graduate program coordinator to ensure that the administration of the Graduate Program functions satisfactorily.

In a formal sense, the director carries the responsibility for decisions regarding issues including governance structure,

policies and procedures, supervisory and teaching loads as well as committee membership. In practice, however, strategic decisions in IRES are delegated to the Management and Faculty Committees, which are both chaired by the director.

The Management Committee

The Management Committee is the unit's strategic decision-making body and handles all strategic issues, with a focus on the RMES program⁴. It consists of all IRES faculty members, core associates (faculty associates who have applied and been approved as core associates by the IRES faculty meeting), student representatives, and the administrative staff. During 2006-2009, the Management Committee met on a monthly basis, with the June and December meetings being full-day strategic meetings. As the unit started to function more smoothly, it was agreed to decrease the number of meetings to three per semester, including a one-day strategy meeting in December and a two-day meeting in June.

The Faculty Committee

The Faculty Committee handles strictly faculty-related issues such as hiring, promotion and tenure. It has been agreed that Faculty Committee meetings are to be called on an as-needed basis, which so far has been approximately once per month during the semester.

The responsibilities of the Management Committee and the Faculty Committee are to some extent overlapping. However, for the most part, the division works well, and facilitates communication among the different groups in the unit.

Student Support System

It is crucial that a complex program like the RMES program provide a support network, as graduate students come into the program with very diverse backgrounds and have considerable freedom in how they design their individual programs. As a consequence, they meet a wider spectrum of issues along their respective degree paths than students

in more traditional programs, requiring multiple personnel to be in place to assist with each new question and issue at hand. As outlined below, the support system provided for the RMES students includes, in addition to the supervisor and the supervisory committee and the director, the two graduate advisors (faculty), the graduate secretary (staff), an Awards committee, an Admissions committee and a Curriculum Committee.

General support system

New students are welcomed during the IRES Annual Celebration in September. During the introduction, they meet the director, the graduate coordinators, the graduate advisor and representatives from the RMES Student Society, who all inform students about the support systems in place. The graduate coordinators work in close conjunction with the director and the graduate advisors, providing a broad support network for students as they make their way through the program. Since 2008, the director meets with each incoming student individually for 15-30 minutes to get a picture of who they are and their expectations, to ensure that they are aware of the support system, and to ensure they know where to go with questions about the IRES organization or administration. In addition, the director meets on regular basis with representatives for the student society. In 2006-2007, the meetings were held on a monthly basis, but as more pressing issues were solved, the need for meetings decreased; at present, the director meets with the president of the student society twice a semester or when called for by either party. The main reason for the decreased need for meetings appears to be improved information routines and more streamlined procedures; for example, all policies are now easily accessible in [the handbook](#). The formation of the RMES Management Committee in 2008 likely also contributed to a reduced need for director-student society meetings (see the 'Governance' section).

The Graduate Advisor

The graduate advisor is a faculty member who, in addition to his/her own teaching and research, works to support the RMES graduate program. The RMES program is a com-

⁴ Strictly faculty-related issues (hiring, promotion, tenure, etc) are managed by the IRES Faculty Committee.

parably large graduate program, and, since 2010, there are two graduate advisors, with the second graduate advisor having a specific responsibility for students in the Fisheries Centre (FC). The role has been served by Terre Satterfield (2005-2007) Stephanie Chang (2008-June 2010) and Kai Chan (July – December 2010). Tony Pitcher (July 2009-June 2010) and Murdoch MacAllister (July 2010-) have been responsible for students in the FC.

Both graduate advisors have an overarching responsibility for the RMES program and their role is, among other duties, to help students and supervisors understand and follow IRES and UBC policies, guidelines and procedures.

Personal information shared with the graduate advisor is kept confidential and shared with the IRES director only when the graduate advisor needs advice. If a student, a supervisor or committee member does not feel comfortable for one reason or another in contacting the designated graduate advisor, they can contact the other graduate advisor, who will inform the IRES director but not the other graduate advisor. The IRES director will, when necessary, discuss issues with the FC director and, if deemed necessary, bring in other resources, such as UBC Equity Office and Faculty Relations.

The Grad Advisor's responsibilities include:

- knowing deadlines, policies and procedures, and ensuring faculty and students are kept informed;
- serving as liaison with FoGS on behalf of the RMES program (e.g., regarding non-UBC committee members, program extensions);

- serving as a contact person for graduate students for information, advice, problems, and appeals; and
- ensuring that academic-progress-checking for students occurs annually and facilitating solutions in case of conflict between students and supervisors/committees.

The Graduate Program Coordinator

The RMES graduate coordinator is a staff member who works on behalf of the graduate students. The graduate secretary's responsibilities include:

- coordinating and managing program admissions in January and responding to enquiries throughout the rest of the year;
- facilitating RMES student progress from admissions to graduation;
- keeping abreast of UBC and RMES procedures/protocol;
- assisting students with the rules/regulations associated with masters theses, doctoral exams and graduation requirements;
- working closely with the graduate faculty advisor in handling student degree progress;
- facilitating classroom listings and time schedules;
- facilitating the inputting of student grades; and
- facilitating department liaison with the Faculty of Graduate Studies.

The Admissions Committee

The Admissions Committee decides which students will be offered admission to the RMES Program. The committee consists of at least three and no more than five faculty

members who are appointed by the director of IRES after consultation with RMES students and IRES faculty members (core and associates). One of the committee members is a faculty member in the Fisheries Centre. The chair is a faculty member who has a deep knowledge of IRES policies and procedures and at least two year's experience of supervision in the program.

The RMES graduate secretary provides administrative support for the committee, prepares agendas in consultation with the chair, prepares the meetings, follows up decisions and takes notes during meetings.

The Awards Committee

The RMES Awards Committee reviews all award applications. The committee ranks applicants in relevance to their research proposals, support letters, service to community and academic standing.

The committee consists of four members who are appointed by the director of IRES after consultation with RMES students and IRES faculty members (core and associates). The committee has a balanced representation to ensure experience and background of relevance to both NSERC and SSHRC applications. The Chair is a faculty member with considerable experience of the UBC/Canadian award system and one of the members is a faculty member from Fisheries. Committee members have a 2-year term and are appointed by the director in August.

The Curriculum Committee

This committee has three functions: a) to review and evaluate new course offerings, b) to register successful new

courses with the UBC Senate, and c) on a less frequent basis, to revise the curriculum in light of the unit's evolving pedagogical objectives.

The research at IRES is issue driven. The methods are interdisciplinary. The goal is to create an educational experience that provides exceptional preparation for the graduates' chosen careers. Through time, the issues, methods, approaches and career opportunities of the graduates evolve. This committee defines the nature of the curriculum and the educational experience that will permit the students to excel.

Catching concerns

The RMES Department has instituted various means by which students are able to voice any issues or concerns they may have with their program of study, supervision or administrative support. Each student goes through a New Student Orientation at the beginning of their first term in RMES. During this orientation, RMES students are informed about the student support network that is in place in the department. Along with the graduate advisor, their research supervisor as well as the graduate secretary, it is made clear to students that the IRES director is also a point of contact should any concerns or questions arise.

A Spring Review (Appendix 20) was implemented in Spring 2010 as a means of forming an interpersonal meeting between first year RMES students, their research supervisors, the graduate advisor and the Graduate Program Coordinator.

Administration

The evolution of an administration that meets IRES's needs

IRES administration has gone through a dramatic change during the past five years. In 2006, IRES' administrative processes and procedures were poorly developed, making the unit highly inefficient and the staff were unable to keep up with day-to-day tasks. The situation was unsustainable and caused excessive workloads, a disruptive and unsatisfactory work environment and led to a high turn-over of staff.

After a turbulent few years, the administration is now efficient, resilient and flexible as compared to the situation in 2006/2007, even though the work load still is high. The present situation has been achieved through the creation of streamlined processes and procedures and solidified routines. A contributing factor to the positive change has been a conscious emphasis on team building and the creation of a more flat, rather than hierarchic, structure, thus creating a sense of shared responsibility for the unit as a whole.

The IRES staff has remained consistent since the summer of 2009, satisfaction with the workplace environment has increased, the working style is more collaborative and the staff members share a collective vision. The fact that the Institute recently produced its first annual report since 2005 and has re-built and re-launched the unit's website are concrete examples that IRES administration is transitioning from a highly dysfunctional and reactive mode to a professional, proactive and efficient organization. Other examples of progress are that the student management system, which previously was entirely manual, has been streamlined by the creation of a database for all student data. This database, although not complete, has the potential to answer complex questions about the students, their programs and funding data quickly and accurately. The application process for new students has been transformed from an entirely manual process to a user-friendly,

online process which is easily accessible through the new website. Project management systems are presently being developed to ease the transition of tasks between staff members and to assist in the management of complex projects. Another conscious approach has been to encourage the staff to grow in their positions by offering them training and other opportunities to develop their skills.

The present IRES administration

Administrative Manager

The unit is serviced with a level A Admin Manager. The administrative manager coordinates and leads the staff team, ensures that the director's initiatives are implemented in a timely and efficient manner, oversees and is accountable for the unit's Human Resources and Financial and Facilities Management portfolios. The administrative manager is responsible for preparing the institute's budget, managing the GPOF, and discretionary funds. The manager is also responsible for ensuring that the unit is in compliance with all UBC and CFIS policies and procedures. The administrative manager oversees that the IRES administrative relationships both within and outside UBC are healthy.

Graduate Program Office

The unit is served with one graduate program coordinator. The Graduate Program Office's responsibilities include coordinating and managing program admissions and responding to enquiries throughout the year, facilitating student progress from admissions to graduation, keeping abreast of UBC and RMES procedures/protocols and assisting students with the rules/regulations associated with exams and graduation requirements. The office is also responsible for keeping the student database up to date. The office works closely with the graduate advisor in handling student degree progress, facilitates classroom listings and time schedules and facilitates the input of student grades and department liaison with the Faculty of Graduate Studies.

Admin support

The unit is served with one admin support person. This position provides support to the Director (ca 25%), to the Graduate Program Office (ca 25%) and to the unit in general (ca 50%).

To the Director: scheduling of meetings, preparing and composing materials, taking and distributing minutes as well as keeping the Director's calendar. To the Graduate program Office: space planning, handling student degree progress, facilitating classroom listings and time schedules and the input of student grades. To the unit: assisting faculty, dealing with facilities management, trouble calls as well as IT issues for students, staff and faculty. Updates website and collates information from the unit's databases in preparation of the Annual report etc. Also responsible for event planning and coordination, room bookings, equipment rentals (laptops, projectors), key requests, couriers ordering of stationary and answering general enquires, Oversees the coordination of work-study students brought in during periods of high work flow, such as during admission, preparation of the annual report and planning of IRES annual celebration at the start of academic year.

Finance support

The unit is served by one full-time finance coordinator with responsibility for research funds and one part-time with responsibility for other finance related tasks. The finance clerks manage and reconcile research grants, takes care of student appointments, manages interdepartmental transactions, responds to faculty requests for financial reports, coordinates p-cards, and interacts with Central Finance, Payroll and the Office of Research Services. The clerks also ensure that all research transactions adhere to UBC's as well as funding agencies' policies and procedures. This includes coordinating communication and financial transfers with institutions in Canada as well as abroad in developing and industrialized countries. Furthermore, the clerks coordinate and administrate faculty and staff development funds as well as travel requisitions, accounts payable, jour-

nal vouchers on all the departmental and research grants. The clerks are also responsible for keeping the unit's finance related database up to date.

IT support

The unit presently buys forty percent IT support from CFIS who provides on-call support for faculty and staff computers and lap-tops.

Changes since 2002 that have influenced the need of administrative support

Since February 2010 the unit has been overstaffed with 0.5 admin staff in relation to its budget and the deficit has so far been covered by accrued savings. A sustainable structure requires that the admin staff is decreased to fit the budget OR that the budget is increased to create a highly functional and efficient staffing situation. IRES administration has remained unchanged in size since 2002, even though several changes have taken place since that created a larger work-load for the administration. It might be the case that IRES needs to increase its staff to properly meet the needs of the unit. The unit is presently using a combined top-down/bottom-up approach to assess its efficiency.

The analysis of the Graduate office is done and the conclusion is that the office is understaffed, rationale given below. The HR-management and the finance office are presently being assessed. The bottom up approach involves identifying work tasks and assessing the amount of time used for each task and the top-down approach involves the identification of benchmarks from other units across campus and elsewhere. Appendix 21 lists changes that have taken place since the inception of the program, which influence the administrative load.

Needs assessment

Graduate Program Coordinator

In years past, due to heavy workload and dissatisfaction, the graduate program coordinator position has had an alarmingly high turnover rate. The workload of the Graduate Program Office has increased significantly since the unit's inception as the size of the RMES program has doubled and other changes given in Appendix 21. Through the streamlining of processes and procedures and the creation of an electronic database, the efficiency of the office has been optimized. Even with these efficiency changes, the office is still overloaded. The unit is seeking help to overcome the technical difficulties involved in having data automatically being retrieved from on-line forms on the unit's website (for student progress, new applicants and admissions process reviews) into the database. It is estimated that this would reduce the work load in the Graduate Program Office with 10-15 %. The newly initiated process of creating two streams in the RMES program (one for the fisheries students (FC) and one for the rest (RES)) might reduce the work load to some extent.

Moving forward, the unit is seeking advice from CFIS, FoGS, other graduate programs and UBC central to identify ways to increase efficiency and a reasonable staffing level for the graduate program. The unit's assessment is that the present need is 1.3 FTE and would increase to 1.5 if the program grows to its supervisory capacity.

To adequately assess the staffing need it is necessary to determine how complex the program is in comparison to other programs. Factors that increase the complexity of the RMES program administration are listed in Appendix 22. Based on this list, the unit's assessment is that it is more complex than most units on the UBC campus, and therefore requires an admin support corresponding to 0.2 staff per 16 students. The assessment is based on structural issues that shape the unique nature of the program that create extra demands on the administrative support.

Finance office

IRES has a large number of research grants, which are often co-managed by two IRES faculty members and used to support students, postdoctoral fellows or the work of a third faculty member. In addition to these, the unit experiences a high level of accounts payable as faculty and students regularly travel for fieldwork and conferences across the globe. Consequently, the volume of work generated for the finance officers within the unit is high.

It is to date unclear whether the present staffing is an adequate level of support or not. The majority of the work presently conducted by the finance coordinator is dedicated to research funds, and, if the unit needs to keep more than one full-time person, it will be necessary to use research grants to cover some of the salary costs. At present, a negligible amount (about \$1000) flows back to the unit as overhead.

Communication systems

Efficient, up-to date communications systems are vital for the success of the unit. A functional and easy to navigate website is a non-negotiable component, as this is the major source of information and communication channel for prospective and current students. It is also crucial that the unit's databases are kept up to date and that the systems are honed and adjusted to and aligned with UBC systems. In addition, the faculty and staff members need a certain amount of IT support.

The unit presently buys forty percent IT support from CFIS, the website is maintained and updated by the Admin Support position and the databases are kept up to date by work study students in conjunction with the Graduate program Secretary and the Admin Support position. The present situation is neither efficient nor fully functioning. IRES is looking into the possibility of creating a new position focused on Communications systems to provide the above mentioned services. A tentative job description is currently being prepared.

Financial resources

IRES general purpose operating fund (GPOF) is approximately \$1M (Appendix 23). About 75 % of the GPOF is faculty salary funding. Three of the IRES professors are Canadian Research Chairs and only a minor fraction of their salaries are included in the GPOF. (Chan tier 2, Chang, tier 2 and Dowlatabadi, tier 1;).

Dr. Öberg, who was hired in 2006, is financed through the Provost office, with a promise in 2007 that the full funding of her position will be permanently added to IRES budget. The budget line for faculty salaries does not include Dr. Öberg’s salary, except in 2007/2008.

Half of Milind Kandlikar’s position was recently moved to IRES and his salary is covered through a 6-year buy-out of Dr. John Robinson while he serves as Executive Director for the University Sustainability Initiative (USI). It is unclear how Kandlikar’s position will be covered for after 2017. The buy out and Kandlikar’s position are not yet included in the budget in Appendix 23.

Staff-salaries is the second largest item in the GPOF (ca \$200,000). A tentative analysis suggests that the unit needs a Admin Manager B, 1.0 Graduate Coordinator, 0.3 Admin support to Graduate Office, 1.0 Admin support to unit and director, 1.5 finance clerk and 0.7 Communications Systems Support. This would put the unit approximately \$50,000 over budget. Since the majority of the work conducted by the finance coordinator is related to research grants, it seems reasonable to tax the research grants to fund this position. It is estimated that a 2% flat tax on all research grant administrated by the unit would be sufficient to cover the salary of the finance coordinator. The unit anticipates that the budget for Graduate Program staff will be increased with 0.3 FTE in the near future. If this does not happen, the unit will have to shrink the program to a sustainable size, i.e. a total of 80 students.

External grants

IRES’s faculty members successfully bring in grants from a variety of sources. The total amount of funding brought in by IRES’s faculty members as PIs or co-PIs during the past five years has varied from about four million dollars in 2007 to over 30 million dollars in 2010 (figure 3). The number of grants brought in each year has varied from twelve in 2009 to twenty-nine in 2007 and the grants’ sizes vary from a couple of thousand dollars to several million dollars.

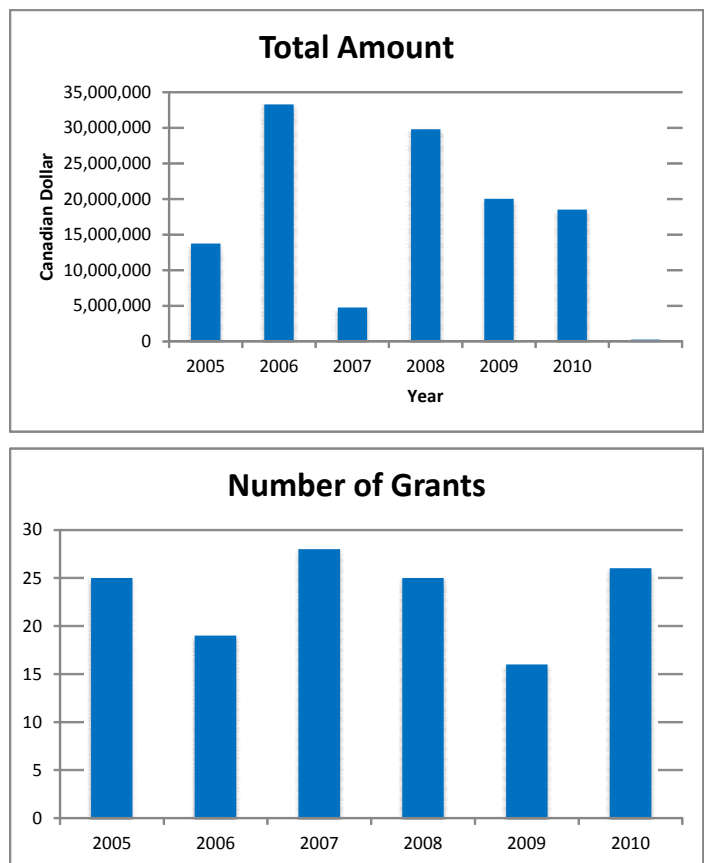


Figure 3. The diagram on top depicts the amount of funding brought in by IRES faculty members in new grants from 2005-2010 as PIs or co-PIs. The diagram below depicts the number of new grants during the same period of time.

Student Funding

Student funding is a key issue in attracting qualified students. The unit conducted a review of the student funding situation in the spring of 2008 and agreed to find different ways to increase student funding. One of the actions taken was to revise the admission and awards process. “Potential to obtain external funding” was added as one of the criteria when admitting students; prospective applicants were encouraged to apply for external funding and supervisors were required to provide a funding plan for students who were admitted without funding. Furthermore, the internal review process for Tri-Council awards was strengthened and students were more actively encouraged and supported to seek external funding. This policy has had a clear effect on the RMES students’ success rate, with the most dramatic change seen in the NSERC grants that have increased from about twenty thousand dollars in 2005/2006 to over two hundred thousand dollars in 2009/2010 (Figure 4).

The majority of students that apply to the RMES are attracted by its interdisciplinary and unique character, and many students have the RMES program as their first choice, irrespective of funding. However, students who decline an offer of admissions for the RMES program typically do so because they have been offered major entrance scholarships from another university. Support from UBC in various forms (tuition waiver, entrance scholarships, four year fellowships, etc.) has varied both in type and amount as the University’s graduate student support system has changed,

which has made it difficult to make solid offers to incoming students. The Faculty of Graduate Studies has reviewed the situation and outlined strategies to simplify the system and to strengthen UBC’s position in relation to other universities. Four year fellowships (FYFs) have, for example, been created as a means to recruit strong students at the PhD level. These scholarships are a very welcome addition, but the fact that they are to be reduced if a student is successful in bringing in a Tri-Council grant or similar funding and the somewhat unclear arithmetic surrounding the awards has made them difficult to administrate. It is too early to say whether or not they actually have been helpful in retaining students. In 2008/2009, the sum of graduate support from the various internal sources amounted to approximately \$180,000 and in 2009/2010 it was approximately \$380,000. The data from the earlier years (2005-2007) is scattered, as the student funding was being restructured, and therefore is not presented here.

The RMES students are also successful in bringing in grants from other sources, with notable awards such as a Vanier scholarship (Sarah Klain, 2010 awardee), Trudeau fellowships (David Boyd 2005 awardee) and Killam fellowships (James Murphy 2009 awardee). Analysis suggests that the amounts brought by students through non-Tri-Council sources is also increasing (from less than ten thousand dollars in 2005/2006 to over sixty thousand dollars in 2009/2010) but the data is incomplete, so it is possible that grants brought in during the earlier years have been overlooked.

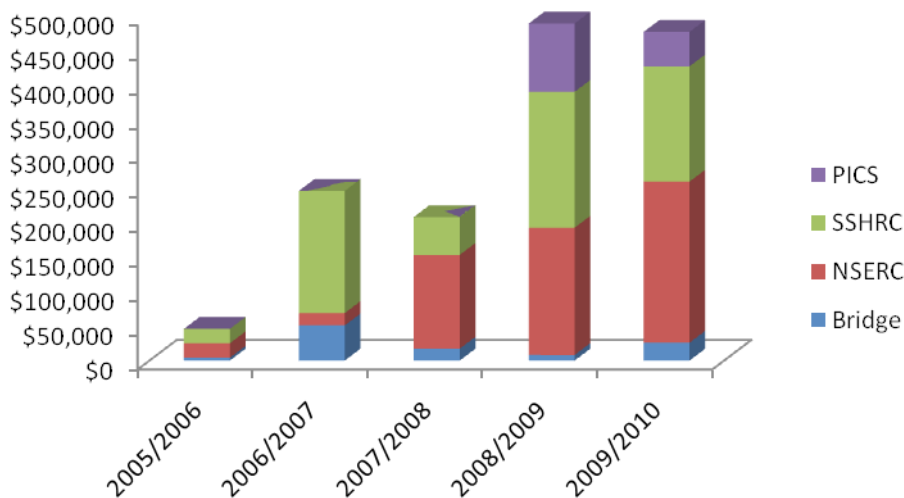


Figure 4 Amount of funding brought in by RMES students 2005-2010. The Program for Pacific Climate Solutions (PICS) started in 2008. The Bridge Program is an inter-faculty program with students working in the nexus between engineering, health and environmental issues.

SWOT analysis

Strengths

- Dedicated, creative, collaborative, highly productive and qualified faculty members who will always challenge the status quo
- Outstanding students
- Professional, collaborative and loyal administrative team
- Good relationships with other units across the UBC campus
- Strong reputation
- Success in winning external grants
- Wide network outside academia
- Placed in non-traditional organizational home like CFIS (also a weakness, as developed in Chapter 4)

Weaknesses

- During the past five years, IRES has moved from a transitional to a highly functional and efficient unit from both academic and administrative points of view. It is very close to reaching the state of a mature organization. The situation, however, is still volatile, in part because the larger university structure in which it is housed is in a currently unstable state, and in part (internal to the unit) because the very strong and colorful faculty members will continue challenge the status quo by demanding ad hoc changes to curriculum, governance structures, administrative processes, administrative structures, and so on.
- Insufficient recurring funding (and thus staff) to run a graduate program of RMES's size and complexity
- Funding for graduate students: The funding cycle (i.e., timing of news of available funding) is out of sync with the admissions cycle, which makes it difficult to retain top-candidate students. Further, each year, a number of students decline offers from RMES, wherein the primary reported reason is that other institutions offer better financial situation – partly a function of the point below, and partly the fact that every school in Canada that UBC sees as its parallel (UofT, McGill, and several second tier Ontario schools) all have vastly better funding support for their graduate students.

- Since IRES does not have an undergraduate program, there are limited opportunities for the students to obtain teaching experience or the TA stipends that accompany these.
- High internal service load, with only ten of thirteen faculty members actively contributing.

Opportunities

University Sustainability Initiative (USI). The publication of UBC's new strategic plan—Place and Promise: The UBC Plan—in 2009, especially with the creation of the UBC Sustainability Initiative (USI) in 2010, signals a very significant upgrading of sustainability campus-wide at UBC. This presents very significant opportunities, but also risks, for IRES. The core concept underpinning the USI is the integration of academic and operational sustainability at UBC; consequently, significant changes in research, curriculum and teaching programs, off-campus partnerships, campus planning and development, infrastructure development, and building operations are under development by the USI. As one of the premiere centres for graduate teaching and interdisciplinary and trans-academic research in sustainability at UBC, IRES is poised to play a central role in these new developments. Conversely, failure to engage with such opportunities may lead to other units at UBC taking on some of the leadership role that IRES has taken to date. A key measure of success in this context will be the degree to which the RMES program and the research undertaken at IRES are connected in an explicit way to the activities of the USI's new Teaching and Learning Office and Research and Partnerships Office. Active collaboration with these offices may allow IRES/RMES to take a strategic role in influencing the direction of graduate curriculum reform and collaborative interdisciplinary and trans-academic sustainability research on a campus-wide basis.

The proposed School of Public Policy will deal with interaction between academia and society, which is one of the pillars in IRES's mission statement. IRES will need to engage in the discussions on the School and clarify internally how it wishes to position itself.

The Liu Institute for Global Issues (LIGI) is planning a new master's program, which will impact IRES since several of the supervisors will be working in both programs. It is also possible that both programs will attract students with an interest in sustainable development in developing countries and it will be necessary to find ways of proceeding that will be mutually beneficial and avoid unnecessary competition. How can the needs of the new program be reconciled with the needs of the RMES program? This is a question of best possible use of administrative as well as academic (supervisory and teaching) resources.

The Fisheries Centre (FC) has been admitting students through the RMES program for decades. The relationship rests upon an oral agreement made early in RMES history: since the FC was not granted their own grad program by Senate, it was agreed that it could run an informal graduate program through the RMES program. As the process of formalizing policies, procedures to establish best practices in the RMES program, and curriculum development progressed, the informal agreement with FC came under scrutiny. The strategic development in the FC has led them to want to increase the number of specific courses while decreasing the number of general courses, which is opposite to the direction identified for the RMES program. In the strategy meeting in June 2010, the IRES faculty therefore agreed to exempt FC students from the requirements that would be imposed by the curriculum review and instead either support the FC in creating their own graduate program or to have CFIS and FOGS agree that an independent FC stream be created within the RMES program. This would resolve the challenges of the present joint program. At the same time, a separate program would mean that the RMES program would lose about one third of its students when the university is currently asking graduate programs to grow. This might only be a question of aligning administrative resources.

Master's in Engineering and Public Policy. The Faculty of Applied Science is preparing a new master's program in Engineering and Public Policy. IRES supports the program's development of and four of IRES's faculty members have been actively involved in the planning process. The program's launch will inevitably have an impact on IRES as several of the faculty members will be expected to teach in

the program. How can the needs of the new program be reconciled with the needs of the RMES program?

Option to fill to fill the empty f-slot through a joint hire with another unit at UBC

Option to exchange Scott Hinch's half position for that of a faculty member in Forestry who wishes to be part of IRES

Threats

- The uncertain and constantly changing budget
- The uncertain future of the College for Interdisciplinary Studies (CFIS)
- New and emerging initiatives at UBC (see above)
 - USI
 - The School of Public Policy
 - Master's program in the Liu institute
 - Master's in Engineering and Public Policy
 - Master's in Land and Water Resources
- UBC's new budget model, which is still under discussion, is such that it remains unclear how funding for graduate-centric units will be maintained in the future. Some of the proposed alternatives suggest that units like IRES, which coordinate faculty members across campus, will have difficulties surviving.
- The uncertain academic staffing situation. To be viable, the unit needs to retain its size. It has been argued that Dorsey's position needs to be used to bridge K. Chan's CRC (which ends in 2014) and McDaniels' position might have to be used to bridge S. Chang's CRC (which ends in 2016); therefore, when Dorsey and McDaniels retire, the unit might not be able to advertise these positions, which would put the unit into a very difficult situation.