Since the completion of the last Academic Plan there have been significant changes in the context for academic planning. As a recent VPA planning document observes we are shifting from a growth phase to a consolidation phase due in large measure to: a slowdown in economic growth; flat-lining if not decreases to university budgets; increased competition in the higher education sector for students; and little growth in the 18-to 24 age cohort group. At the same time, for the Faculty of Environment, two significant changes have occurred in the planning assumptions. One, because of fiscal austerity measures and cutbacks, the assurance of 8 to 10 net new positions for program development is no longer guaranteed. The other change relates to the introduction of a new budget model based upon weighted enrollment performance. These are new and unanticipated headwinds that add to the complexity of developing a new Faculty.

Clearly we need to adapt to these new exigencies in imaginative and creative ways if we are to achieve our overarching mandate which is:

“Positioning FENV at SFU to become a world class leader in evidenced based research and teaching that integrates natural, social, SIS and policy sciences, and pure and applied research, to reconcile environment and development at different spatial and temporal scales.”

It has been said that “change is opportunity in disguise.” So how do we respond? In the previous plan we identified the importance of integrating environmental expertise across the university as a hybrid Faculty to promote interdisciplinarity. Arguably this has become, given present resource constraints, an even more important if not pressing need.

In addition to the integration and interdisciplinary objective we see importance in focusing our attention and energies in five other areas:

1. Ensure we build upon the research, teaching and community outreach strengths of our newest member—Archaeology.

2. Continue with the development and consolidation of new undergraduate and graduate programming that ensures exposure to interdisciplinary and experiential learning opportunities; and differentiates SFU from other Environment Faculties/Schools.

3. Develop strategies for reconciling our budget shortfall.

4. Focus on learning outcomes—in terms of specific goals and evaluation methods.

5. Develop unique partnerships to strengthen the research mission and opportunities for knowledge mobilization (See Table 1, attached).

We are confident that we can manage these objectives successfully over the next five years and to elevate the prominence and reputation of the Faculty in such a way to complement the overall goals of the University with respect to ‘engagement’ across the spectrum of responsibilities.

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2 The Incomparable Honeybee, R. Halter, Rocky Mountain Books, 2011.
Faculty Core Activities

1) Academic Units:
   - Department of Archaeology
   - Department of Geography
   - School of Resource and Environmental Management
   - Environmental Science Program
   - Centre for Sustainable Community Development
   - Development and Sustainability Program

2) Academic Programs:

   Undergraduate Majors:
   - B.A. Archaeology (Major and Honours)
   - B.A. Archaeology and Anthropology (Joint Major)
   - B.A. Archaeology and First Nations Studies (Joint Major)
   - Double Minor, Environment
   - B.Sc. Environmental Science (Major and Honours)
   - B.A. Geography (Major and Honours)
   - B.A. Geography – Environmental Specialty (Major and Honours)
   - B.Sc. Physical Geography (Major and Honours)
   - B.A./B.B.A. Business Administration and Geography (Joint Major)

   Undergraduate Minors:
   - Minor, Archaeology
   - Extended Minor, Archaeology
   - Minor, Development and Sustainability (DEVS)
   - Minor, Geography
   - Extended Minor, Geography
   - Minor, Physical Geography
   - Minor, Geography - Environmental Specialty

   Undergraduate Certificates and Diplomas:
   - Cultural Resource Management Certificate (Archaeology)
   - Certificate in Environmental Literacy (Environment)
   - Certificate in Spatial Information Systems (Geography)
   - Urban Studies Certificate (Geography)
   - Certificate in Sustainable Community Development (SCD)

   Graduate Programs:
   - M.A. Archaeology
   - Ph.D. Archaeology
   - M.A. Geography
   - M.Sc. Geography
   - Ph.D. Geography
   - Master’s degree (MRM) in Resource Management
   - Master’s degree (MRM) in Planning
   - Ph.D. in Resource and Environmental Management

   University Curriculum & Institutional Liaison:
   - Change Lab
Graduate/Post-Baccalaureate Certificates and Diplomas:

- Graduate Certificate, Development and Sustainability (DEVS)
- Graduate Diploma in Quantitative Methods in Fisheries Management (REM)
- Post Baccalaureate Diploma in Sustainable Community Development (SCD)

Professional Development/Career Programs:

- Professional Certificate in Sustainable Community Development
- Certificate Program for Community Economic Development Professionals

3) Centres and Institutes:

- Centre for Forensic Research
- Centre for Coastal Science and Management
- Centre for Sustainable Community Development
- Centre for Tourism Policy and Research
- Cooperative Resource Management Institute (CRMI)
- Hakai Network for Coastal People, Ecosystems & Management

4) Joint Activities:

A) Academic Programs:

**Applied Sciences**
- B.Sc. Geographic Information Science (Major and Honours)

**Arts and Social Sciences**
- B.A. Archaeology and Anthropology (Joint Major)
- B.A. Archaeology and First Nations Studies (Joint Major)
- Ethics Certificate (Concentration in Ethics and the Environment)
- First Nations Studies Research Certificate (undergraduate)
- B.A. International Studies
  - (Int’l Development, Economic and Environmental Issues Stream)
- Urban Studies Certificate (undergraduate)
- Urban Studies Master Program

**Biological Sciences**
- Environmental Toxicology Master Program

**Beedie School of Business**
- B.A./B.B.A. Business Administration and Geography (Joint Major)

**Earth Sciences**
- Forestry Geoscience Certificate (undergraduate)

**Education**
- Environmental Education Minor
- Environmental Education Post Baccalaureate Diploma

**Graduate Studies**
- Modeling of Complex Social Systems Graduate Certificate
B) SFU Centres, Institutes and Groups Outside FENV:

- Centre for Global Political Economy
- Centre for Natural Hazards Research
- Climate Change Impacts Research Consortium
- Evolutionary and Behavioral Ecology Research Group
- Human Evolutionary Studies Program
- Institute for Canadian Urban Research Studies
- Institute for Environmental Learning
- Institute for Values in Science and Policy
- Interdisciplinary Research in the Mathematical and Computational Sciences
- Stavros Niarchos Foundation Centre for Hellenic Studies

C) Inter-institutional Partnerships

- Adaptation to Climate Change Team
- Bamfield Marine Sciences Centre
- Centre for Interactive Research on Sustainability (UBC)
- C3 Collaborative/CityStudio
- Forum for Research and Extension in Natural Resources (FORREX)
- Pacific Institute on Climate Change Solutions (PICS)

**Planning Assumptions**

We have assumed that The Faculty of Environment remains a University priority. Within this context and given the recent changes to the budget allocation model, FENV will be given sufficient time to transition to a more revenue robust situation by planning for growth in enrollment through new curriculum options and growth in VISA students.

**Strategic Influences and Directions**

**Opportunities**

In our last plan under this section reference was made to: “The new Faculty is well positioned to capitalize upon a number of strategic opportunities in teaching, research and outreach. Perhaps most importantly are the strong complementarities that exist in teaching and research within the Faculty among the founding units. In particular all the founding units have a number of opportunities to strengthen undergraduate teaching through various partnerships and joint programming initiatives”. This is now even more the case with the addition of Archaeology.

**Curriculum Development**

Detailed discussions and planning are now underway with respect to the following curriculum initiatives (See Table 2, attached):

- A highly interdisciplinary Bachelor of Environment
- A joint major with Business Administration
- Environment One Program in Surrey
- Redesign of the undergrad Environmental Science program (completed)
- Specialized grad and undergrad GIS courses for REM and Archaeology students
- Collaborative Teaching Fellows program (we are entering the third year of this program)
- An online Masters in Sustainability
- Certificate in Environmental Literacy (approved)
- MSc in Ecological Restoration (with BCIT)

We also look forward in developing joint programming with Health Sciences. Given the volume of new initiatives it has not been possible to date to explore new initiatives.
Research Strengths and Synergies
We see a central role of Centres/Institutes and networks associated with FENV to promote knowledge mobilization and community outreach/engagement. These include:

- Centre for Sustainable Community Development
- Centre for Coastal Science and Management
- Hakai Network for Coastal People, Ecosystems and Management
- Cooperative Resource Management Institute
- Centre for Tourism Policy and Research

In addition to these formal centres and institutes there are for example in REM, Geography, Archaeology and the Development and Sustainability group a number of research cores which have evolved to the point of national and international prominence. And in keeping with our desire to differentiate ourselves from other Environment Faculties/Schools we celebrate our breadth and diversity in research which extends beyond more ‘traditional’ environment/resource management specializations that provide important areas for study. The high success rate at attracting funding from SSHRC, NSERC, CIHR and MSF by faculty members is a testimony to the high quality and impact of research conducted within FENV. Moreover CTEF funding to Mark Collard in Archaeology has initiated a innovative and novel research project linking human evolutionary specialists across the University.

Just as GIS/SIS are important research tools that further the research missions of Geography, REM, Archaeology and Environmental Science so too there is common ground over research, teaching and outreach on aboriginal/indigenous issues by the same units.

Fostering Our Integrating Role
In terms of “integrating expertise across the University as a hybrid Faculty”, we see this as a long term objective that can be strengthened in the short term by the following initiatives:
- Collaborative teaching fellows program
- Joint degrees with, for example, Business and Health
- Widening the involvement of non-FENV faculty in research institutes/centres; advisory groups; and joint research programs
- Cross-appointments.

Faculty Additions
During the past three years faculty hiring has occurred in climatology; terrestrial ecology; remote sensing; aquatic ecology and energy economics. These are strategically very important to ensure we either enhance existing strengths or build on new ones. It is hoped, after the very strong recommendations from the Archaeology external review, that the department will be authorized to hire in the areas of bio-anthropology and environmental archaeology. In addition to these areas of specialization there are plans to pursue at least two NSERC Industrial Chairs- in avalanche risks/hazards; ocean sustainability. And we have begun to fund raise for a Chair in Indigenous Sovereignty, Governance and Stewardship.

Other faculty hiring priorities include enlarging expertise in:
- Applied Ecosystem Management
- Urban/Community Sustainability/Settlement Planning
- Water Resources Planning/Hydrology
- Global Environmental Change/Development
- Environmental Toxicology/Environment and Health
- Ethnicity/Race/Indigenous Geographies

Advancement
We have been very active in a variety of advancement related activities that have improved funding for scholarships and bursaries; reconnected in a meaningful way with our alumni; promoted partnerships with community groups; and of course raised significant endowment monies for the Hakai Network for Coastal People, Ecosystems & Management and the Liber Ero Chair. We continue to see great potential in extending
these activities to another level. Our current Advancement prospectus identifies the following funding priorities:

- Development of a wildlife forensics analysis facility
- A graduate program and Institute in Ecological Restoration
- A Chair in Avalanche Risk Assessment
- Materials And Energy Sustainability Institute
- Chair in Indigenous Sovereignty, Governance and Stewardship
- Environmental Leadership in Action Program
- Environmental Change Initiative

**Outreach**

While most faculty have outreach activities that are often an integral part of their research institutes, centres and networks mentioned above are all invested heavily in community engagement. Perhaps most successful of these is the Centre for Coastal Science and Management and the associated environment outreach programs such as ‘Planet Under Pressure’ and ‘Speaking of the Salmon Series’ to name just two.

In addition, the Dean’s office supports the University Tour office with on-demand talks and tours to support recruitment efforts, as is a willing participant and sometimes leader in planning on-campus recruitment events and visits from school groups.

**Student Experience**

In all of the major undergraduate programs improvement in student experience has become an important undertaking that is taken very seriously by the Faculty. Some of the more laudable examples include: co-op; field studies; field schools and semester abroad programs; research apprenticeships; cohort study; and student exchanges. I doubt if there is another Faculty that offers the same level of options and opportunities for experiential learning opportunities. All of this said there is scope for improvement in fine tuning our approaches to student centred learning and learning outcomes.

We have, with the support of Student Engagement & Retention, piloted a Peer Mentorship program designed to help support new, incoming secondary school student adjust to their first term at SFU by pairing them with a senior student in their program. It is proving to be quite successful, as gauged by the new students’ feedback.

Further details below on Co-op and Career Services have been provided by Work Integrated Learning staff.

Work Integrated Learning (WIL) is comprised of Co-op, Career and Volunteer Services. WIL (www.sfu.ca/wil) provides support for career development for all SFU students via career education, advising, resources, experiential programs, and facilitating student connections with a network of employers, faculty, alumni and other community members. WIL engages with students early in their SFU experience – for example, WIL has regularly collaborated with FENV for student recruitment and orientation.

**Career and Volunteer Services:**

Career and Volunteer Services offered one-on-one advising, workshops and various information sessions and career events for FENV students on all three SFU campuses.

There were approximately 100 formal individual advising appointments for FENV students in 2011/12 related to topics such as career exploration, resumes, cover letters, interview skills, networking, general and social media work search strategies, etc. This number of appointments represents ~10% of the FENV student population. There is clearly an opportunity for FENV students to take further advantage of advising support, but this percentage is higher than other faculties due to referrals from FENV academic advisors and co-op staff. FENV students were also able to access informal drop-in advising during various career events such as: Geek Week, The Big Fair, Round Robin Resumes and others.
Career Services offered recent graduates the opportunity to be involved with a Job Finding Club (2 week full-time group-support program of 18 participants), with two FENV alumni accepted into the program.

All SFU students have access to a broad range of workshops, career panels and employer information sessions. In the 2011/12 year, Career and Volunteer Services offered over 50 workshops, 100 employer information sessions, other career-related events (such as What Can I Do in Government, So You Want to Go to Grad School, Working & Studying in the U.S.), and a large career fair in fall 2011 with participation from environment-related employers. A new event in spring 2012, “Green Careers”, gave FENV students the opportunity to have conversations in small groups with 9 different organizations focused on the environment and sustainability. Many of the employers that shared their diverse occupations, career paths and words of wisdom were SFU Alum and regularly hire SFU co-op students.

Co-operative Education:

The co-op program is available to all undergraduate students in FENV as well as REM students at the graduate level. Interest and participation in the co-op program has remained steady, and co-op work term placements are stable (see Figure 1) in spite of the recent cuts to federal government agencies which have historically been strong supporters of the co-op program (e.g., Environment Canada).

Co-op students had access to one-on-one advising with a program-specific co-op coordinator and a co-op advisor (specializing in resume, cover letter, interview skills support). The co-op program also offered specialized workshops (both online and face-to-face) covering topics such as skills transfer, resumes, cover letters, interview skills, working in an international co-op role, transitioning from school to work environments, etc.

Governance

It is important, given our limited resources and yet growing diversity in what we do, that we ensure that our governance models are sufficiently attentive to co-ordination, collaboration and management issues in timely way. Succession planning has become increasingly important in non-departmentalized units such as the Environmental Science Program; the Development and Sustainability Program; and the Centre for Coastal Science and Management.

Threats/Challenges

Clearly the deteriorating budget situation in higher education in the Province could have particularly painful implications for a new Faculty such as Environment. This combined with our current budget deficit are sources of real concern. Related to this are as yet unfilled positions in both Geography and Archaeology which seriously undermines teaching and research objectives. And we need to plan for the expected retirements of human geography and REM faculty over the next five years. This planning cycle is therefore an appropriate time to work creatively and constructively with the VPA to find solutions to the budget deficit-some of which are presented below under ‘Growth Scenarios’. To that end we need the support of SCEMP, SCUP and Senate to ratchet up our enrollment numbers.

The quantity and quality of our space requirements in REM and Geography remain a serious constraint. And of course FENV units are spread across campus which is the exception rather than the norm for most

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<th>Figure 1: FENV Co-op Placements, 2008 - 2012</th>
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<tr>
<td><strong>TOTAL</strong></td>
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<tr>
<td>Archaeology*</td>
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<td>Geography</td>
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<tr>
<td>Env. Science</td>
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<td>REM (grad)</td>
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*NOTE: Archaeology placements recorded in FENV as of 2012, previous #s unavailable at this time.
Faculties at SFU and not conducive to unifying the Faculty. If the School for Communication moves to Harbour Centre this would free up space in the TASC1 for the Department of Geography to relocate to.

We have had a very high turnover in advancement personnel that has impacted negatively the continuity and success of raising external funds for FENV.

Technical staffing issues remain an obstacle to the conduct of research and teaching in REM, Geography, Environmental Science and Archaeology. Related to these deficiencies the Archaeology Museum is badly in need of university financial support.

And at a very different scale a new report by the Expert Panel on the State of Science and Technology in Canada released by the Council of Canadian Academies paints a conflicting picture of the health of environmental research and its application in Canada. The capacity for knowledge mobilization and technological transfer is nowhere close to its potential nor to addressing the very significant challenges posed to society and environment from greenhouse gas emissions.

Efficiencies

We believe that the most significant instructional efficiencies can occur through closer co-operation in programming at the undergraduate and graduate levels within and among the primary units. One example would be better use of the expertise and courses in GIS/SIS in Geography to assist with the instructional needs/requirements in REM, Archaeology and Environmental Science. Another would be improvements in course access and greater utilization of course capacity. A third area would be to increase class sizes at the third and fourth year level. Three other areas may improve overall efficiencies—joint hiring and cross appointments; greater use of lecturers; and, in some cases, streamlining of the curriculum to reduce low enrollment specialty classes and a reduction in course diversity.

With respect to technical support we see great merit in sharing among all units a computing/instrumentation specialist who can assist with electronic interfacing in field-based research.

The Collaborative Teaching Fellows program, which is now entering its third year, has succeeded in integrating environmental expertise that is spread across campus. This should avoid duplication and allow for a richness of expertise that would not otherwise be the case.

Lastly, from an administrative efficiency perspective we have discussed the possible formation of a ‘Division of Integrated Research & Programming,’ a loose confederation of new initiatives and incubator projects whose overarching theme is reconciling environment and development. This confederation would economize on support personnel.

Faculty Goals and Objectives

In the last plan reference was made to: “An overarching objective is to continue the work begun in the first half of 2009 in defining the choices in research, teaching and outreach available to us and to act selectively on those choices to define an identity and a coherent program of enquiry which is strategic, cross-cutting, creative, integrative, student-centred and visionary yet practicable.” These considerations are as valid and guiding as they were three years ago.

We have achieved the majority of the objectives as set out in the last plan. We have collapsed our ‘shared tasks’ to six main objectives. To restate:
In addition to the integration and interdisciplinary objective we see importance in focusing our attention and energies in five key areas:

1. Ensure we build upon the research, teaching and community outreach strengths of our newest member - Archaeology.

2. Continue with the development and consolidation of new undergraduate and graduate programming that ensures exposure to interdisciplinary and experiential learning opportunities; and differentiates SFU from other Environment Faculties/Schools.

3. Develop strategies for reconciling our budget shortfall.

4. Focus on learning outcomes - in terms of specific goals and evaluation methods.

5. Develop unique partnerships to strengthen the research mission and opportunities for knowledge mobilization (See Table 1, attached)

**Unit Assessments**

Archaeology (ARCH)

**Strengths**

We have identified four key research and teaching strengths: archaeological science; Pacific Rim archaeology; biological anthropology, and Indigenous studies.

Our department has a strong record of integrating archaeological sciences into teaching and research programmes. Our laboratory classes as well as our field schools provide an excellent environment for experiential learning. Several faculty members lead research initiatives that are strongly based in environmental and archaeological science. Potential areas of teaching/research growth in this area include Geographic Information Systems (GIS), landscape archaeology, quantitative methods, zooarchaeology, lithics and ceramic analysis.

**Archaeological studies in the Pacific Rim** involve several modes of research, including archaeology in British Columbia and internationally, and historical archaeology. Our research programmes in British Columbia heritage and archaeology are multi-dimensional and involve collaborators from other SFU departments, including REM, other universities, and First Nations communities. We conduct research on the south coast, the Plateau, central coast and northern BC. We have strong ties with leading national institutes of archaeology in China in terms of collaborative research and graduate student/faculty exchange.

The main foci in our biological anthropology programme are in ancient DNA, human evolutionary and forensic studies. SFU bioanthropologists are investigating ancient DNA in both archaeological and forensic contexts. Forensic scientists in the Department of Archaeology and School of Criminology are the main participants in SFU’s Centre for Forensic Research. Forensic science has been designated as a research priority for SFU, supported by a major strategic investment in the building of new research facilities in Saywell Hall. The mandate of this centre is to pioneer “new applications of forensic science to solving crimes, identifying victims, exonerating the innocent and convicting the guilty”¹. Members also participate in casework in collaboration with the BC Coroner’s office as public service. In addition, collaborations with the World Wildlife Fund are in progress. The Archaeology Department has recently developed a dynamic research cluster in human evolutionary studies (HES) which is a focus of a Canada Research Chair, several SFU faculty members, postdoctoral research fellows, and graduate students.

**Indigenous studies** have focused on the areas of Indigenous heritage stewardship, intellectual property, and the development of virtual web-based museum exhibits. Partnerships among academic archaeologists, Indigenous peoples and other governments, and private entities are increasingly focused on mobilizing indigenous knowledge and advancing indigenous goals to deal with a reassessment of what to conserve in the face of unprecedented global change. Several faculty are working in this area, including a Canada Research Chair in Indigenous Heritage Stewardship. Intellectual property issues are being investigated in the context of a SSHRC MCRI project involving more than 50 scholars and 25 partnerships from national and international organisations (including Canada, United States, New Zealand, Australia, Kyrgyzstan, South Africa, Botswana, and Japan). This is an unprecedented and innovative investigation of intellectual property issues in cultural heritage that represent emergent local and global interpretations of culture, rights, and knowledge. The Museum of Archaeology and Ethnology (MAE) constitutes an important component of our public education, out-reach, and teaching programme. The museum is an invaluable resource which could be more fully utilized by other FENV units.

**Weaknesses**
Teaching and research in Old World archaeology and primatology should be a significant component of any archaeological/bioanthropological programme, but owing to a lack of resources, these areas are not strongly emphasized in our department.

While Archaeology has been well supported in terms of laboratory facilities and operating budgets (with the exception of the Museum), support for urgently needed continuing faculty and staff positions has been non-existent over the past five years. This constitutes a serious threat to many facets of our programme and to the overall running of our department.

Despite highly favourable external reviews since 1998, the loss of 4.5 FTE faculty members through retirement/secondments from a total FTE complement of 12 in 2007 has impacted every aspect of our programme, with a particularly devastating impact on teaching/research in archaeological sciences. It has also led to larger class sizes in lower-division archaeology classes with no tutorial sessions and loss of tutorials for some upper division lab courses and field schools. Faculty down-sizing has meant the removal of several significant and popular archaeology classes, such as *The Prehistory of Religion*, *The Vikings*, and *Prehistory of Britain*. It also places limits on our abilities to maintain our graduate programme. Our reduced faculty complement also impacts our ability to compete with the proliferation of colleges and other degree-granting institutions in British Columbia who are offering degrees in archaeology, forensic science, and field schools. In addition it has created significant increases in faculty and staff workloads.

A second significant threat is in our staffing levels. With the addition of the Saywell Hall archaeology labs in 2008, we have not had a corresponding increase in technical support personnel. External reviews dating back many years have recommended increases in technical and museum staffing even prior to the addition of the Saywell Hall labs.

**Centre for Sustainable Community Development (CSCD)**

**Strengths**
Our core strengths exist in three areas: 1) the quality, demand, and potential flexibility of our undergraduate course structure; 2) the binding and integrative potential of our research capacity; and 3) our community engagement.

Our SCD courses remain in high demand – and provide the Centre with the flexibility to offer both an undergraduate certificate and a post-graduate diploma. We have maintained the structure of the courses – Harbour Centre delivery, capped at approximately 30 students – given the success of this model and our preference for a more interactive pedagogy. We are open to considering expansion of the courses to Surrey delivery (possible within the proposed BEnv) and/or course expansion to include a first-year SCD course for inclusion in the BEnv or Env 1 programs.
The Centre has an impressive record of attracting research funding. This funding has brought together faculty from various departments (Geography, REM, Business, Sociology, Latin American Studies, Dialogue) highlighting the interdisciplinary nature of our work and the extent to which we tackle research projects – and the problems they pose – in a highly integrative fashion.

Finally, both our courses and research projects maintain a high level of community engagement, a critical if not primary goal of SFU’s new vision. Our courses link students with community organizations through course projects, directed studies, and practicum projects for Certificate and Diploma completion. Our research is also highly interactive with community organizations, businesses and governments both locally and internationally. As the University moves to track and monitor community engagement activities, recording and enhancing the engagement capacity of the Centre will provide a significant asset to FENV.

Weaknesses
The Graduate Diploma was introduced originally due to its relative ease of creation within the university structure, and as a gateway to an eventual Master’s level program. While the Diploma continues to provide a service to students interested in continuing their education, but without the full commitment of a MA program, we have found that the currency of the Diploma has faded – challenged both by the relative expansion in sustainability-related education programs and the increasing flexibility offered by various competing programs.

The creation of a Master’s program (Masters in Sustainability) housed at the Centre, potentially offered in partnership with the Centre for Online and Distance Education (CODE), will fulfill our original intentions associated with building the capacity of the Centre. This may then warrant a discussion on the continuing need for, or adaptation/evolution of, the Diploma program option.

Development and Sustainability Program (DEVS)

Self Assessment: Our strengths have been a gradual increase in commitment to DEVS over the ten years since its inception as the Development Group, a campus-wide network among those interested in sustainability (with newcomers each year), a willingness to contribute to a teaching program outside our original ‘job descriptions’, and confidence in the future of this special concentration. We appreciate the good will that such a largely voluntary program has built up, and our new strength is that we have the instructional resources and administrative assistance to mount both an undergraduate and graduate programs. We have also demonstrated our capacity to attract students both to our graduate program and undergraduate program. There is steady enrollment in the graduate program, and increasing enrollment in the undergraduate program.

Our weakness is structural, that we began on borrowed time and, while functioning more efficiently and effectively now, we have reached the limits of what we can achieve with borrowed resources. We need permanent faculty to anchor the DEVS program in the FENV in order to maintain what we have accomplished to date and for future growth of the program. We are waiting to get a secondment or appointment of a person (or persons) whose attention will be largely on program building. We are currently not a ‘departmentalized’ unit, and the director now achieves outcomes largely by moral suasion. Thus we probably need to re-think our governance structure, to make appointments with staggered terms which allow us to make decisions relatively quickly and effectively.

Environmental Science (EVSC)

Strengths
The redeveloped Environmental Science program is unique and timely. Key strengths of the program include;

1) long-standing success with interdisciplinary teaching,
2) the cohort model that arose from the program redesign,
3) its current relevance to today’s environmental challenges, and
4) its continued commitment to technical science training that lies at the core of its streams (program foci).

The program is now rapidly growing. As of 2012, 187 students were enrolled in the program. Of these, 86 have declared their majors, a 2-fold increase since 2006. Current enrollments in EVSC 100 at Burnaby and Surrey 205, a 2.5 increase from when the course was offered in 2007 as EVSC 200. Clearly EVSC has captured the interest of students and will likely continue to attract students and grow.

In January 2013, a new director will take over administration of the program and he is committed to continued growth of the program and greater engagement of faculty, both within FENV and from the program’s partner units outside the faculty.

Weaknesses
The EVSC program is a program within a Faculty comprised of a large department (Geography), a moderately sized department (Archeology) and school (REM). EVSC has no dedicated faculty, which means EVSC courses must be serviced by faculty from other units or sessional instructors. There is now a Director who both administers the program and teaches 3 of the 4 required courses including EVSC 100 and two new seminar capstone courses EVSC 399/499. A sessional instructor (PhD candidate in REM) will teach a new second year lab course in spring of 2013 and is now teaching the first year EVSC at Surrey. The current director completes her term in December 2012 and will return to the Faculty of Science to resume teaching and administrative responsibilities within her home unit. The incoming director will, over the next 2 years transition some of his teaching load from his home unit (Geography) to EVSC. The specific courses to be taught is a matter on ongoing discussion with the Dean and his home unit. The unfilled positions in Geography make the process difficult. However, the new director will likely teach one new upper division course in the EVSC program that is currently taught between Geography and Biology as a special topics course and will be involved in the lower division entry level EVSC 100 course and the two new capstone seminar courses. Nevertheless, teaching EVSC 100 and the capstone courses will likely fall to a sessional instructor. This is hardly ideal for a program undergoing rapid growth. There is little availability of faculty from FENV units to contribute teaching to the EVSC program because they are also heavily reliant on sessional instructors. Continued success and growth of the EVSC program requires additions of new faculty to the FENV units who can be engaged in teaching within the EVSC program, as well as contributing to their home units.

Geography (GEOG)

Strengths
Interdisciplinarity: Geography’s enduring strength relates to its nature as an interdisciplinary discipline. Geography may be defined as: how place (and space) shapes physical and social processes, and their interactions, as they work themselves out in differentiating and integrating the earth’s surface. Geography as a discipline has no monopoly on this perspective but concerns for how and why places around the globe are different and how and why places are integrated (across space) around the globe are at the heart of modern geographical practices. Geography is diverse, integrative and dynamic. SFU Geographers do research, inter alia, on development, medical tourism, augmented reality, mountain tourism, sustainable development, property, cellular automata, environmental economic geography, consumption, limnology, resource depletion, health informatics, port cities, political economy, soil-plant relationships, political ecology, fluvial geomorphology, policy transfer, climate change, and paleoglaciology.

Research: SFU Geography has an excellent research profile, with strengths across physical geography, human geography and spatial information science. We are successful in securing funding across the board, from NSERC, SSHRC, and CIHR. New hires in landscape ecology, climate modeling and remote sensing have provided extra impetus to the physical geography and SIS programs. Hires over the past several years in the human geography program are now entering the Associate Professor ranks with considerable momentum. There is every indication of increased productivity across the Department in terms of publications and research funding. A crude index is provided by the annual CAG Directory. In 2008, the list of SFU Geography publications took up just over 2 pages. The most recent Directory has over 4 pages
of publications. Departmental members have also secured prestigious awards. Anecdotal evidence indicates that the Department is well regarded internationally. We have been able to ‘punch above our weight’, for example, when it comes to recruiting graduate students. A Thomson-ISI Science Indicator Ranking exercise for 1981-2005 ranks SFU Geography 4th in Canada in terms of publication impact.

**Collegiality:** The 2006 evaluation of the Department noted: ‘the congenial atmosphere that prevails at all levels of the Geography Department, including the faculty, the supporting staff, the graduate and the undergraduate student bodies. Goodwill and tolerance are major assets that stand the Department in good stead. Collegiality is accompanied by the strong desire to maintain the Department as a single entity, with its human, physical and SIS components staying together within the same unit. This spirit of collegiality and integration should be protected and nurtured’. We know of no evidence that collegiality has diminished.

**Undergraduate program:** The program is robust, with high enrolments, and renewed growth, both in majors and WAFTEs. A course streaming exercise has seen greater coherence in both BSc and BA programs. We have expanded opportunities in experiential learning, with the adoption of field courses. Many bottlenecks (eg pre-requisites and course requirements) have been reduced. New courses have been created, with offerings in Surrey and in Distance Education. We offer two successful Certificates. Past declines in majors have given way to modest growth. At last count, we had 387 majors. As of 2010-11, we were the fifth largest Geography program in Canada, measured by the number of majors.

**Graduate program:** Students are successful in funding their work through CIHR, NSERC, and SSHRC scholarships. Students move through the program efficiently and we have been graduating around 15 students per year in recent years. The program attracts students of increasingly high quality from many parts of the world. The program’s quality is exemplified by students’ publication rates. Many students publish singly or as part of groups in some of the top national and international journals and our program has a consistent presence in all the major international conferences. We also attract a steady stream of visiting scholars and postdoctoral fellows, who both enrich and also learn from our graduate students.

We have developed a number of opportunities for graduate students to engage in professional development. These have included departmental workshops and also a workshop developed with our colleagues at UBC and the University of Washington, and a new Distinguished Lecturer series that invites major figures in geography to visit the department and engage with graduate students, thus enhancing their professional capabilities and also ‘selling’ our program to the ‘outside world’. Concerns about a lack of opportunities for graduate students to come together with each other and with faculty in social settings have been addressed by instituting new events, including one welcoming new students in the Fall.

**Engagement:** We are a strong example of an ‘engaged’ Department. Many Department members are actively involved various partnerships with government, industry, community groups and marginalized populations, at local, national and international scales. Examples include research collaborations with First Nations (e.g. Blomley/Hul’qumi’num Treaty Group); government (e.g. Crooks/Ministry of Health; Hall/New Westminster Museum and ILWU; Knudby/Department of Fisheries and Oceans; Venditti/Federal Ministry of Environment); community groups (e.g. McCann, Blomley/Carnegie Community Action Project; NGOs (e.g. Mann/Canadian Centre for Policy Alternatives; Zickfeld/Forest Ethics); Industry (e.g. Venditti/Northwest Hydraulic Consultants and Port of Metro Vancouver); and international organizations (Sturgeon/Chinese Center for Biodiversity and Indigenous Knowledge; Brohman/Bolivian Ministry of Indigenous Affairs). Beyond this community engagements, Geography faculty have been very active in University and disciplinary service contributions.

**Internal weaknesses** in meeting research, engagement/service and teaching goals over the next 2-3 years:

**Faculty renewal:** Some of our colleagues are aging, particularly on the Human Geography side – five HG colleagues are close to or over 65, and one is four years away, with one physical geographer four years away from 65. While these are active members of the Department, whose contributions are highly valued, there are undeniable questions relating to the future faculty complement. The issue is compounded by a net
erosion in faculty numbers in the Human Geography program, given resignations and transfers, and the unfortunate health problems of some colleagues.

Faculty gaps:

**Hydrology:** The confirmed loss of our hydrologist creates a significant gap in our programming and research, particularly in relation to Physical Geography and Environmental Science (EVSC). At this time of climate and environmental change surface water research and teaching is a vital component of a modern Geography program and Environment Faculty. Hydrology courses are popular electives in PG major/Hons (all 3 streams) and EVSC major/Hons (Environmental Earth Systems; Water Science). This also creates additional challenges in supporting the field school (already taxing our resources). The field school is a required course for professional registration as a geoscientist in BC, an important accreditation for our physical geographers wanting to work in the increasingly competitive and expanding geoscience consulting industry.

**Race/Indigenous geographies:** A second critical gap remains the oft-repeated priority for research expertise in ethnicity/race/indigenous geographies, particularly pressing given the place in which we are located, and the student body we serve. This is also aligned with the President’s Plan, which underscores the need to engage respectfully with indigenous peoples and culture.

**Teaching load:** Faculty shortages and buyouts mean that we are forced to rely on sessionals and/or cut back on course offerings. Mounting a tri-semester program is a particular challenge. We have made increasing use of Limited Term Lecturers: while valuable members of the Department, longer term planning becomes more challenging. Equity questions are also raised in relation to differences in the opportunity to access buyouts, which may extend into service inequities.

**Physical infrastructure and technical support:** The status of our offices and labs, a longstanding issue of concern for previous Plans, is becoming increasingly problematic. Cramped into inadequate spaces, and plagued with leaks, pest infestations and other problems, the issue is becoming critical. This is a longstanding concern of the Department, raised in multiple external reviews. We also lack a dedicated meeting space, which constrains a stronger sense of Departmental unity. A related, but larger issue, concerns the fact that FENV units are dispersed throughout the university. There would be clear benefits to collegial interactions and communications if all units could be housed on one site.

It has also been noted by several physical geographers that the hiring of a research technician support person to handle the growing pool of research equipment – field equipment, lab instruments and associated computers - would be of considerable assistance. At present, much tech support is being provided directly by faculty. Ideally, this person would be able to provide instruction to other faculty students or graduate students to ensure a productive use of equipment.

**Resource and Environmental Management (REM)**

**Strengths:**
REM plans to build on its strengths in providing innovative, cross-disciplinary, applied research and graduate education in the areas of natural resources and the environment and expand in the area of undergraduate education. Following the recommendations in the recent external reviews, REM strategic plan includes the following elements:

First and foremost, REM aims to maintain and strengthen its highly successful masters programs in Resource & Environmental Management (MRM) and the Resource & Environmental Management (MRM) – Planning program. Secondly, REM plans to grow its successful Ph.D. program to further strengthen its research and to develop a better balance between research, education and community support that will improve the experience of Master and Ph.D. students in REM and the reputation of SFU in the community. Thirdly, REM plans to respond to the large demand for undergraduate courses in the area of the environment by increasing the number of undergraduate course offerings and the development of a minor in resource and environmental management. This initiative is well underway with REM offering now 14 undergraduate courses and a certificate program in Environmental Literacy. Fourth, REM plans to
strengthen its role in “engaging communities” through the work of its centers and institutes, including the Centre for Sustainable Community Development (CSCD), Center for Tourism Policy and Research (CTPR), Hakai Network for Coastal People, Ecosystems, and Management, the Cooperative Resource & Environmental Management Institute (CRMI) and the new planned Pacific Institute for Human and Environmental Toxicology.

Challenges:
1. To maintain the cross disciplinary nature of the Master and Ph.D. programs and research strengths of REM in the face of faculty retirements or departures without certainty of faculty replacements.
2. To fill areas that are of fundamental importance to resource and environmental management, where REM does not have appropriate expertise. These positions include:
   a. First Nations’ governance, resources, sustainability and environment
   b. Geographical information systems
   c. Physical Hazard & Risk assessment
   d. Applied terrestrial ecology & conservation
3. To develop strengths in emerging areas of interest including Ecosystem-Based Management, Food Politics, Security and Sustainability; and Environmental Design.
4. To develop stronger educational and research programs to support resource based industries in Canada.
5. To find funding for graduate students with the goal to continue to attract the best students.

Possible Long Term Growth Scenarios

Guiding Principles
In our previous plan we set out the following “Guiding Principles” or themes for a hybrid faculty to assist in making choices and to provide a rationale for why we do what we do:

- FENV will serve as the natural focal point for the co-ordination and promotion of environmental research and teaching at SFU.
- New programming needs to reflect the importance of the integration of knowledge of social, natural, policy and Spatial Information Sciences. GIS and SIS have the potential to be a binding glue for FENV.
- Physical Geography is a Science and is deserving of inclusion in all programs that require basic Science.
- Interdisciplinarity and collaboration will become accepted elements of FENV’s modus operandi.
- Scholarly activities in the Faculty are intellectually inspired to address environment issues, broadly defined. In its areas of expertise, future programming will emphasize core areas of basic research as well as applied and problem-solving studies.
- Secondments of faculty to support research and programming are to be supported if appropriate models for improved collaboration can be devised.
- Experiential learning including field classes, co-op, cohort programs, study abroad, practical workshops, special mentoring, and community based service learning, is to be encouraged where possible and an accepted part of the Faculty’s pedagogy.
- Promoting environmental literacy is a critically important teaching and outreach mandate.
- Community service learning and the application of scientific knowledge to the resolution of environmental problems becomes an accepted part of knowledge dissemination, mobilization and outreach.
While BC should serve as our living laboratory we must not lose sight of international focus and expertise.

Partnerships including student exchanges with other research institutions, within and outside BC, are to be encouraged.

Engagement with First Nations and other communities should become an accepted practice of our mandate.

**Revenue Generating Strategies**

If FENV is to grow it must do so through a variety of revenue generating strategies including:

1. Expansion in the number of VISA students taking FENV courses.
2. Increasing FENV course content for individual programs to improve FTE numbers.
3. Expand undergraduate programming capacity using existing courses along with a small number new course offerings.
4. Development of premium fee programs for a Masters in Sustainability.
5. Develop joint programming with BCIT for a Masters in Ecological Restoration.
6. Consider fund raising for programs such as Ecological Restoration.
7. Fund research chairs through both individual fund raising and sponsorships from the NSERC Industrial Chair program.

Our long-term goal is to expand VISA students by between 50 and 80 FTE; and our undergraduate complement by 200 to 300 FTEs. Graduate enrollments could expand by 40 to 60 FTEs. These additions will not eliminate the deficit but they provide a significant boost to our weighted FTEs and a formula for success in the future.

**Costs**

Costs associated with this will not be proportional to the number of FTEs for the following reasons:

- Excess capacity in some areas
- Enlarge class sizes at the upper division level
- Greater use of adjuncts for course instruction
- Reduce course diversity in some areas

We estimate that between five to six net new faculty position will be sufficient increment to offset the increased instructional needs.

**Communication**

The Faculty has developed its five-year plan in close consultation with its departments, school, centres whose chairs/directors submitted their own five-year plans in early September. As well, the internal and external advisory committees were consulted. As a result, this plan has had many iterations, as discussions with these groups prior to completion warranted changes and additions.

In the lead-up to this plan being formed, we discussed our options at the Dean's Advisory Committee (DAC) meetings and the draft version will be distributed and discussed at the next DAC meeting on October 2. The External Advisory Committee will receive it electronically and be asked for feedback at that time, as well.

The final version that is submitted to the VPA will be distributed to all Faculty committees, units and to our faculty and staff; it will also be posted prominently on our website, www.fenv.sfu.ca.

Our website content is refreshed and revised frequently in an effort to attract and maintain the interest of current and prospective students, alumni and prospective donors, as well as the general public. We also interact with these groups through social media and will post highlights of the final version of this plan.
there, as well.

Along the same lines, the Faculty continues to promote its academic programs, public events and news on its website and through social media. We work closely with Student Services in recruiting undergraduate students to the Faculty, and with PAMR to promote significant milestones of and within the Faculty. Our partnerships with both internal and external groups help our students to grow and develop through scholarship funding, extracurricular activities, and mentorship programs, to name just a few areas where our students are making connections. In addition, we participate in conferences, career fairs and community events to share our vision, which is encapsulated in this document, with the general population, with the goals of attracting students and inspiring the desire to learn.

The Faculty is committed to growing its student population and continuing to educate the environmental leaders of tomorrow.
Table 1
FENV Unit Primary Strengths

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<tr>
<th>ARCH</th>
<th>CSCD</th>
<th>DEVS</th>
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<tr>
<td><strong>Archaeological/Environmental Science:</strong></td>
<td>CSCD conducts rigorous applied and participatory research that is committed to developing practical, effective solutions for environmental, social and economic challenges, and possesses a unique understanding and approach to support businesses and communities in their transition to sustainability.</td>
<td>Development Group members have individual research programs in their home units.</td>
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<tr>
<td>• D’Andrea: palaeoethnobotany, cereal domestication, traditional agricultural knowledge, ethnoarchaeology, early agriculture, early complex societies, African archaeology</td>
<td></td>
<td>Research connects across university interests in international, Canadian, and/or local development and sustainability issues and problems</td>
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<tr>
<td>• Galdikas: primate ecology, orangutan conservation</td>
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<td>Focus in new Faculty is on development and environment &amp; sustainability from social, environmental, economic, political, cultural, scientific, technological, and historical dimensions of the quality of life, and those responsible for it.</td>
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<tr>
<td>• Lepofsky: palaeoethnobotany, human ecology, prehistoric and traditional resource management</td>
<td>• Market Mechanisms for SCD</td>
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<td>• Muir: zooarchaeology, quantitative methods, archaeological computing, American Southwest</td>
<td>• Strategic Sustainability and Community Infrastructure</td>
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<td>• Reimer: lithic technology, materials science, geochemistry</td>
<td>• Food Security and Food-Related Micro-Enterprise</td>
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<td>• Winter: artefact conservation</td>
<td>• The Social Economy in BC and Alberta</td>
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<td>• Yang: ancient DNA, molecular archaeology, animal and plant ancient DNA</td>
<td>• NGOs on a Northern Frontier</td>
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<tr>
<td><strong>Biological Anthropology</strong></td>
<td>• Sustainable Consumption and Production</td>
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<td>• Collard: human evolution, primate evolution, evolutionary archaeology, phylogenetics, hominin and non-human primate fossil record, body size estimation, material culture studies</td>
<td>• Forest Communities</td>
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<tr>
<td>• Galdikas: primate behaviour and evolution</td>
<td>• Civil Society</td>
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<tr>
<td>• Yang: human osteology, ancient DNA, forensic anthropology, wildlife forensics</td>
<td><strong>International Research Projects:</strong></td>
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<tr>
<td><strong>Indigenous Studies</strong></td>
<td>• Bolivia: Specialization in CED (2007-2012)</td>
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<tr>
<td>• Nicholas: Indigenous peoples and archaeology, intellectual property issues in cultural heritage, archaeological theory</td>
<td>• Mexico: Building Capacity in CED (2001-07)</td>
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<td>• Ukraine: CED Project (2004-07)</td>
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<td><strong>Other Research areas:</strong></td>
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<td></td>
<td>• sustainability leadership skills</td>
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<td></td>
<td>• Aboriginal Community Economic Development</td>
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<td>• active engagement with various community organizations</td>
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<td>• housing and community sustainability</td>
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<td>• understanding collaboration for sustainable development</td>
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<td></td>
<td>• research and teaching are highly interconnected.</td>
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<td>ARCH cont.</td>
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<td>--------------------------------------------------------------------------</td>
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<tr>
<td>• Reimer: Indigenous archaeology</td>
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<td>• Welch: Indigenous heritage stewardship, American Southwest, resource</td>
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<td>management practice and policy</td>
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<tr>
<td>• Yelllowhorn: Indigenous archaeology, oral history, traditional</td>
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<tr>
<td>knowledge, ethno-science, Palaeoindians, astroarchaeology, Aboriginal</td>
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<td>experience in the modern world, Plains archaeology</td>
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<td>• Winter: museology; public outreach, visual archaeology, video and new</td>
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<td>media</td>
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<th>Pacific Rim Archaeology</th>
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<tr>
<td>• Burley: South Pacific, Northwest North America, archaeological theory,</td>
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<tr>
<td>South Pacific prehistory, ceramics, maritime adaptations, ethnohistory</td>
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<td>• Jamieson: Andean South America, colonialism, the built environment,</td>
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<td>material culture, gender/status, ethnicity, ethnohistory, South</td>
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<tr>
<td>American prehistory</td>
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<tr>
<td>• Lepofsky: Northwest Pacific, Oceania, complex hunter-gatherers, public</td>
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<td>outreach</td>
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<tr>
<td>• Muir: BC archaeology, material culture, cultural resource management</td>
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<tr>
<td>• Nicholas: BC archaeology, hunter/gatherers, cultural ecology,</td>
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<td>wetlands, postglacial land use</td>
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<tr>
<td>• Reimer: BC archaeology, cultural resource management</td>
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<tr>
<td>• Welch: BC archaeology, public outreach</td>
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<tr>
<td>• Yang: East Asia archaeology</td>
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Table 1 cont...
FENV Unit Primary Strengths

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<tr>
<th>EVSC</th>
<th>GEOG</th>
<th>REM</th>
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<tr>
<td>The Environmental Science Program is an undergraduate program and research is conducted in faculty members’ home units so EVSC does not currently have a research program.</td>
<td>Research expertise is in: <strong>Cities, Culture and Society themes</strong>  • Sturgeon: China, property rights in natural resources, shifting cultivation and cash cropping, governance, borders and boundaries, ethnography of globalization, ethnicity and identity;  • Kingsbury: Consumption, aesthetics and nature, cultures and sustainability, multiculturalism;  • Holden: Urban, sustainable development and policy, sustainable assessment and evaluation, social learning in cities;  • McCann: Urban, drug policy in relation to urban and regional built environments, urban public space and governance, urban and regional ‘liveability’, ‘quality of life’ and ‘creativity’;  • Blomley: Land, property and the geography of rights, legal geography, urban;  • Gill: Tourism and environmental planning processes, community-based planning;  • Crooks: Health, primary health care, palliative care services and family medicine, informal family care giving, health-related social programs, socio-spatial negotiations of chronic illness.  <strong>Resources, Development and Environment themes</strong>  • Clapp: Resources, remapping the temperate rainforests for biodiversity; advisory and advocacy science in the environmental policy process; institutional and economic approaches to the conservation of forest ecosystem services;  • Brohman: Development, Latin America, development and environment in the ‘south’;</td>
<td>Research groups are:  • Fisheries Science and Management Research group led by Sean Cox, and Andy Cooper  • Energy and Materials Research Group (EMRG) Research group led by Mark Jaccard, Jonn Axsen  • Climate, Oceans, and Paleo-Environments (COPE) Research group led by Karen Kohfeld  • Sustainable Planning Research group led by Tom Gunton, Murray Rutherford, and Peter Williams, Sean Markey  • Co-Management Research group led by Evelyn Pinkerton  • Environment and Development Research group led by Duncan Knowler  • Applied Community Ecology Research group led by Anne Salomon  • Environmental Toxicology Research group led by Frank Gobas  • Forest Ecology and Management Research group led by Ken Lertzman  • Indigenous Heritage Stewardship Research group led by John Welch  • Parks and Recreation Research group led by Wolfgang Haider  • Tourism Policy and Research Group led by Peter Williams  <strong>Additional research themes in REM</strong>—most of which addressed by several research groups.  • Quantitative analysis and modeling of ecological data and systems  • Choice modeling in the environmental and social sciences  • Climate Change Impacts, Analysis, Adaptation, and Mitigation  • Ecological Economics  • Ecosystem-Based Management  • Risk Assessment and Decision Analysis</td>
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<td>GEOG cont.</td>
<td>REM cont.</td>
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<tr>
<td>• Mann: Resources, natural resource labour and labour markets, comparative natural resource policy, macroeconomic policy and commodity production, race and gender;</td>
<td>• Strategic Land-Use Planning</td>
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<tr>
<td>• Hayter: Industrial, BC’s forest industry, the location dynamics of business firms, and regional development, environmental economic geography.</td>
<td>• Community-Based Management</td>
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<td>• Water Planning and Management</td>
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<td>• Applied Conservation Biology and Planning</td>
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<td>• Environmental Conflict and Dispute Resolution</td>
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<td>• Public Policy Analysis and Administration</td>
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<td>• Environmental and Social Impact Assessment</td>
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<td>• Community and Regional Planning and Sustainability</td>
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<tr>
<td>Biogeophysical and water science themes</td>
<td>• Water Planning and Management</td>
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<tr>
<td>• Venditti: Fluvial, river geomorphology, fluvial sedimentology, river hydrology, stream restoration,</td>
<td>• Applied Conservation Biology and Planning</td>
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<td>• Lesack: Limnology, ecosystem science of large rivers, carbon and nutrient cycling in lakes,</td>
<td>• Environmental Conflict and Dispute Resolution</td>
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<td>hydrology of lakes and river floodplains, biogeochemical mass fluxes to the ocean from small</td>
<td>• Public Policy Analysis and Administration</td>
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<td>catchments through large rivers;</td>
<td>• Environmental and social Impact Assessment</td>
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<td>• Brennand: Glacial geomorphology, glacial sedimentology, paleoglaciology, paleohydrology,</td>
<td>• Community and Regional Planning and Sustainability</td>
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<td>environmental and climate change, planetary geomorphology;</td>
<td>• Water Planning and Management</td>
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<td>• Schmidt: impact of deciduous trees on nutrient cycling in conifer forests, impact of forest</td>
<td>• Applied Conservation Biology and Planning</td>
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<td>management practices on soil properties and site productivity, rehabilitation of degraded forest</td>
<td>• Environmental Conflict and Dispute Resolution</td>
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<td>soils. Zickfeld: climate modeling, climate-carbon cycle feedbacks, emission implications of</td>
<td>• Public Policy Analysis and Administration</td>
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<td>long-term climate targets, climate tipping points. Krawchuk: landscape ecology, biogeography,</td>
<td>• Environmental and social Impact Assessment</td>
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<td>pyrogeography, conservation science</td>
<td>• Community and Regional Planning and Sustainability</td>
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<td>Hertzman: Atmospheric science, including climate and weather observation and model interpretation</td>
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<td>GIS/SIS’s</td>
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<td>• Schuurman: Health and Environment, optimal location of health services, population health;</td>
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<td>• Hedley: Visualization, 2D geovisualization, 3D</td>
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<td>GEOG cont.</td>
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<tr>
<td>geovisualization; geospatial interface research, natural hazards, ocean science, spatial cognition;</td>
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<tr>
<td>• Dragicevic: Modeling of complex spatial environmental systems, modeling land use, land cover and urban growth; modeling dynamic spatial phenomena in forestry and landscape ecology;</td>
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<tr>
<td>• Balram: Collaborative GIS and environmental decision making.</td>
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<td>• Knudby: Basic and applied remote sensing, spatial ecology and predictive modeling</td>
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## Table 2
Development Timeline for New Programming & Degree Options

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<tbody>
<tr>
<td>Surrey Campus Environment One Program</td>
<td>X</td>
<td>Start-up planned</td>
<td></td>
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<tr>
<td>Program and Course Level Learning Outcomes</td>
<td>X</td>
<td>For new courses and programs</td>
<td>For new &amp; existing courses and programs</td>
<td>For new courses and programs</td>
<td>For new courses and programs</td>
<td>For new courses and programs</td>
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<td>Designation of additional FENV courses as W, Q or B</td>
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<tr>
<td>Review/modification of graduate certificates if direct admission is approved</td>
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<tr>
<td>Bachelor of Environment Credential (BEnv)</td>
<td>X</td>
<td>X</td>
<td>Possible start-up</td>
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<tr>
<td>BEnv Majors/Concentrations</td>
<td>X</td>
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<td>Possible start-up</td>
<td>Analysis &amp; Modification</td>
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<td>BEnv Major/ Concentration in Environmental Health</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Possible start-up</td>
<td>Analysis &amp; Modification</td>
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<tr>
<td>Alternative/New FENV Majors/Concentrations</td>
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<tr>
<td>Minor in Resource and Environmental Management</td>
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<td>Start-up planned</td>
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<td>Analysis &amp; Modification</td>
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<td>Project Description</td>
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<td>Possible start-up</td>
<td>Analysis &amp; Modification</td>
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<tr>
<td>Masters in Sustainability and/or Master in Development &amp; Sustainability</td>
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<td>Masters in Ecological Restoration (SFU/BCIT Collaboration)</td>
<td>X</td>
<td>X</td>
<td>Possible start-up</td>
<td>Analysis &amp; Modification</td>
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<td>Development &amp; implementation of FENV field schools with multiple FENV &amp; non-FENV units</td>
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<td>Development &amp; 2013 piloting (w/Biology)</td>
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<td>Possible certificates in Human Settlements, Archaeological Science and SIS</td>
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<td>Expand experiential courses and integrate existing experiential courses in FENV programs</td>
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<td>Investigation of online teaching opportunities</td>
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<td>Exploring integration between UG, G and professional instruction.</td>
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<td>Integration with BISC and FHS on toxicology</td>
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