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www.sfu.ca/vpacademic**MEMORANDUM**

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<b>ATTENTION</b>	Senate	<b>DATE</b>	March 19, 2015
<b>FROM</b>	Jon Driver, Vice-President, Academic and Provost, and Chair, SCUP	<b>PAGES</b>	1/1
<b>RE:</b>	Faculty of Science: External Review Update for the Department of Earth Sciences (SCUP 15-15)		

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At its March 11, 2015 meeting, SCUP reviewed the External Review Update Report for the Department of Earth Sciences within the Faculty of Science. The report is attached for the information of Senate.

c: G. Myers

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**MEMORANDUM**

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**ATTENTION** Jon Driver, Chair, SCUP  
**FROM** Gord Myers, Associate Vice-President,  
Academic  
**DATE** February 20, 2015  
**PAGES** 1/1  
**cc** B. Ward and C. Cupples  
**RE:** External Review Update for the Department of Earth Sciences



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The External Review of the Department of Earth Sciences was undertaken in March 2011. According to the procedures established by SCUP, the Unit is required to submit an update describing its progress in implementing the Action Plan, which was derived from the External Review report, in the fourth year following the start of the External Review process. Please find attached this update, together with a copy of the Action Plan approved by Senate.

Based on this midterm report, my assessment is that the Department of Earth Sciences has made substantial progress toward implementing the Action Plan, within the constraints imposed by its budget.



DEPARTMENT OF  
EARTH SCIENCES

Dr. Brent Ward, PGeo  
Associate Professor  
Earth Sciences  
Faculty of Science

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January 27, 2015

Dr. Glynn Nicholls,  
Director  
Academic Planning and Budgeting  
Rm 3183 Strand Hall

**RE: External Review Update for the Department of Earth Sciences**

Dear Glynn,

Please find attached the External Review Update for the Department of Earth Sciences. I created this report with input from relevant Earth Sciences Faculty. If you have any questions or require clarification, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink that reads "Brent Ward".

Brent Ward  
Department Chair

Cc: Claire Cupples, Dean of Science

## External Review Update for the Department of Earth Sciences

Action	Progress Made
<b>1. Programming</b>	
<b>1.1.1 Undergraduate</b>	
<ul style="list-style-type: none"> <li>• Curriculum</li> </ul>	<p>We have evaluated our curriculum with regard to its alignment with APEG BC requirements as well as our students' needs as developing professionals. We moved our third year Environmental Geoscience course (EASC 303W) to second year (EASC 209W). This provides our students with an introduction to the broad field of Environmental Geoscience before they are required to select their stream at the end of second year.</p> <p>We also changed the senior field school, EASC 406 to EASC 308. This course now focuses on environmental subjects and sedimentology, topics previously under-represented in our field schools.</p> <p>We also created a separate Metamorphic Petrology 311 course so that we cover all three rock types (Igneous, Sedimentary, and Metamorphic) equally and in sufficient detail.</p> <p>We also have revamped EASC 305 to provide students with quantitative tools such as statistics, linear algebra, time series, spatial analysis and computer modeling employed to solve geologic problems.</p>
<ul style="list-style-type: none"> <li>• Collaboration with other academic units</li> </ul>	<p>We have developed a joint major and joint honours programme with Chemistry. We are also collaborating with Geography to provide sufficient funds to upgrade John Clague's GPR system. We have not spent much time exploring curriculum arrangements with Geography, but we are very involved with curriculum development in The Water Science and Environmental Science programs.</p>
<ul style="list-style-type: none"> <li>• Student recruitment</li> </ul>	<p>The program has continued to deliver general interest 1<sup>st</sup> year courses with the dual purpose of increasing enrollment and attracting new majors. This, along with outreach, has worked as our undergraduate</p>

	enrollments in second year are at record levels.
<b>1.1.2 Graduate</b>	
<ul style="list-style-type: none"> <li>• Course work</li> </ul>	We decided against developing broader interest, team-taught graduate courses. Finding suitable courses and determining teaching credit remain problematic.
<ul style="list-style-type: none"> <li>• Funding</li> </ul>	We realize that it is expensive to live in the lower mainland for graduate students. Our funding levels exceed that of NSERC, and all our incoming students are guaranteed a minimum salary regardless of TA support. Our support is similar to other departments in the Faculty of Science. We are unsure what more we can do.
<ul style="list-style-type: none"> <li>• Student environment and interaction</li> </ul>	Students receive all relevant information before they arrive, once they arrive, and throughout their residence in the program; this includes a comprehensive graduate student "handbook". Some students do not read their e-mails. All scholarships available are circulated to the graduate student community. All graduate students are encouraged to attend the weekly departmental seminars. As well, the graduate students organize an afternoon coffee where students from all disciplines can interact with one another. Several research groups in the Department also have graduate student discussion groups.
<b>2. Research</b>	
<ul style="list-style-type: none"> <li>• Enhanced interaction</li> </ul>	We have attempted to increase collaboration with other Departments. However, research collaboration is an individual endeavour. Several faculty members actively collaborate with faculty in other departments (e.g. 4D Labs, Biology, Chemistry, Health Sciences, Physics, REM,).
<b>3. Administration</b>	
<ul style="list-style-type: none"> <li>• Constitution</li> </ul>	Unfortunately, the Department has not re-examined its constitution. It was last updated following our first department review, and the terms of reference have really not changed much over the years.

<ul style="list-style-type: none"> <li>• Policies, procedures, communication</li> </ul>	<p>We have strived to have more Departmental meetings, ensuring at least 1 per term. We schedule more meets when topics warrant.</p>
<b>4. Working Environment</b>	
<ul style="list-style-type: none"> <li>• Space</li> </ul>	<p>Little progress has been made on the issues of departmental space. We were unable to secure the extra lab space in TASC-1. No dedicated coffee room has been created owing to the excessive costs required. We continue to maintain a daily coffee time, held in a common area in an atrium near the department office. The Dean provided money for extensive renovations of K7654 to make a combined lecture/lab space, that has helped to relieve the strain on our existing lab/lecture space. Unfortunately, that expansion came at the cost of one of the graduate student offices. We continue to suffer from a shortage of graduate student space, post-doctoral space, visiting scholar space and an undergraduate student common area.</p>
<ul style="list-style-type: none"> <li>• Equipment</li> </ul>	<p>The Dean has provided funding for a new bus, a suite of petrographic microscopes, and other field equipment to facilitate the teaching of the Department's field schools.</p>
<b>5. Planning Exercises</b>	
<ul style="list-style-type: none"> <li>• Strategic Plan</li> </ul>	<p>There has been no development of s strategic plan. However, we are planning a Departmental Retreat this term. Development of a Strategic Plan is an action item.</p>
<b>6. Other</b>	



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MEMORANDUM

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**ATTENTION** Brent Ward  
Chair, Department of Earth Sciences

**DATE** November 24, 2014

**FROM** Glynn Nicholls  
Director, Academic Planning and Quality Assurance

**PAGES** 1

**COPY** Claire Cupples  
Dean, Faculty of Science

**RE:** External Review Update for the Department of Earth Sciences

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As per Senate guidelines, the Department of Earth Sciences is to report on progress being made in the implementation of the Action Plan that resulted from its external review in March 2011. This report will be presented to SCUP and Senate for information.

Please submit your progress report, using the attached template, by January 12, 2015. Also attached, for ease of reference, is the Action Plan that was approved by Senate on December 5, 2011.

Although your external review took place prior to the requirement to develop educational goals and assessment beginning with the 2013-14 external review cycle, any progress being made in your department in defining program and/or course level educational goals for academic programs would be welcome in your progress report.

Please contact me at 2-6702, [glynn\\_nicholls@sfu.ca](mailto:glynn_nicholls@sfu.ca), or Bal Basi at 2-7676, [bbasi@sfu.ca](mailto:bbasi@sfu.ca), if you have any questions or concerns regarding the external review update process.

Attach.



**EXTERNAL REVIEW – ACTION PLAN**

**Section 1 – To be completed by the Responsible Unit Person e.g. Chair or Director**

Unit under review	Date of Review Site visit	Responsible Unit person,	Faculty Dean
Department of Earth Sciences	March 9-11, 2011	James MacEachern, Chair	Claire Cupples

*Note: It is **not** expected that every recommendation made by the Review Team be covered by this Action Plan. The major thrusts of the Report should be identified and some consolidation of the recommendations may be possible while other recommendations of lesser importance may be excluded. Should an additional response from be warranted it should be attached as a separate document.*

**1. PROGRAMMING**

**1.1 Action/s (description what is going to be done):**

- 1.1.1 Undergraduate:**
- **Curriculum.** The Review Team noted that, despite our general success at undergraduate education and high student satisfaction, our curriculum has recently become slightly out-of-date with reference to the educational requirements of APEGBC, the Provincial authority that governs the practice of engineering and geoscience in British Columbia. Specifically, the Provincial educational requirements have recently been modified to achieve alignment with the new National syllabus. The Review Team suggested that Earth Sciences undertake a complete review of its curriculum, from course content to scheduling and frequency of course offerings. The Department of Earth Sciences agrees with the comments of the Review Team and will embark on a comprehensive review of the undergraduate program. We will redesign our curriculum to meet the new academic requirements and provide students with a solid foundation coupled with breadth and flexibility. Consideration of course scheduling and availability will be integrated with the new academic program. The educational requirements for both the Geology and Environmental Geoscience registration options of APEGBC will be mirrored by two of our academic Streams. Converting these Streams to Majors, as approved by the Department in 2010, will not be pursued without a thorough evaluation.
  - **Collaboration with other academic units.** The Review Team expressed strong interest in seeing the Department of Earth Sciences develop stronger programming ties with other academic units. It applauded our participation in the new Water Science program in the Faculty of Environment and recent progress toward a Joint Major with the Department of Chemistry. The Review Team noted that further collaborations are desirable, particularly with the Department of Geography. The Department of Earth Sciences, in partnership with the Department of Chemistry, expects to seek University and Provincial approval for a Joint Major in the immediate future. The Department of Earth Sciences will continue to hold discussions with the Department of Geography on the subject of mutually beneficial curricular arrangements, and will explore the potential for joint programming with other academic units.

- **Student recruitment.** The Review Team noted that undergraduate enrollment in the Department of Earth Sciences is growing, but is still at modest levels. It suggested that the Department continue its outreach effort, and work with the Faculty and the University to enhance the visibility of Earth Science programming to attract additional students. In particular, it recommended that Earth Sciences 101 become a required component of the General Science degree program. The Department will work with the Faculty and the University to raise the level of awareness of Earth Science programs, and will continue its outreach and recruitment activities. The Department recently voted to change the titles of its two most fundamental courses in order to attract greater numbers of students (pending approval, EASC 101 will change from *Physical Geology* to *Dynamic Earth* and EASC 210 will change from *Historical Geology* to *Evolving Earth*). The issue of converting program Streams to Majors will be examined in the context of program visibility and student recruitment (see information on *Curriculum*, above).

#### 1.1.2 Graduate:

- **Course work.** The Review Team recognized that graduate education in the Department is progressing well, and appreciated the challenge of providing graduate students with courses that are relevant, sufficiently specific and well populated. To address what it perceived as a tendency toward highly specific course topics and an absence of courses with broader applicability, the Review Team recommended that the Department consider mounting some team-taught courses with general topics such as "geochemistry." The Department will consider developing courses along the lines envisaged by the Review Team, i.e., "courses that would interest a broader cross-section of students."
- **Funding.** The Review Team noted the high cost of living in Metro Vancouver and suggested that the Department endeavour to raise the minimum yearly student earnings, possibly by paying graduate students a higher salary for work as Teaching Assistants, or by reducing the number of students it takes on. The Department recognizes the challenge of providing adequate graduate student funding, which is derived from scholarships, teaching assistantships and faculty research (mainly NSERC) grants. Rates of pay for TAs are governed by a collective agreement over which the department has no control. Reducing the number of graduate students in Earth Sciences, in order to provide more TA opportunities for fewer students, is theoretically possible but is contrary to the expressed desire by the University to increase graduate enrollment, the increasing pressure from NSERC on faculty to develop larger graduate student research groups, and the NSERC-defined limits on the size of stipends payable from NSERC grants. In summary, action to increase student stipends will be discussed but may not be possible without additional investment in graduate student funding from the Faculty, University or Province. It should be noted that the Department's guaranteed levels of student support currently equal or exceed the maximum levels specified by NSERC.
- **Student environment and interaction.** The Review Team noted that some aspects of the overall student experience could be improved, including communication of administrative information and student supervision. It suggested greater flow of information, more consistent standards regarding annual evaluations, and enhanced interaction with guest speakers. The Department will review its practices to ensure that the graduate environment is administratively fair and transparent. The criteria for scholarships are already widely disseminated; however, the department will create a section on the web-site for current students where all key information can be easily located. The guest seminar series will be maintained as a vehicle for

student interaction, knowledge enhancement and professional growth.

**1.2 Resource implications (if any):**

The Department has limited financial resources to bring in guest lecturers and fund graduate students. If either of these areas becomes significantly expanded, funds will need to be diverted from our modest operating budget, or additional funds will need to be provided.

**1.3 Expected completion date/s:**

The Department of Earth Sciences expects all of the action items to be complete or well advanced by May, 2012. Outgrowths from some action items (for example the mounting of new undergraduate or graduate student courses) may require additional time to complete, and will be contingent on approval at higher administrative levels.

## 2. RESEARCH

**2.1 Action/s (what is going to be done):**

- *Enhanced interaction.* The Review Team noted that many of our faculty cooperate in research, but suggested that more interaction would be beneficial, especially for some of the smaller research groups. The reviewers also note that opportunities for collaboration with faculty in other departments and externally should be considered, and that research at the margins of existing disciplines as well as across disciplines is potentially beneficial. **The Department appreciates the comments of the Review Team and expects that Earth Sciences faculty will consider strengthening research ties with faculty in other academic units and with personnel in other universities and outside agencies.**

**2.2 Resource implications (if any):**

Additional research space will be required to permit Departmental growth, regardless of the areas of research.

**2.3 Expected completion date/s:**

The Department of Earth Sciences expects all of the action items to be complete or well advanced by May, 2012.

### 3. ADMINISTRATION

#### 3.1 Action/s (what is going to be done):

- **Constitution.** The Review Team recommended a review and modernization of the departmental constitution. The Department will undertake a review of its constitution and other relevant documents such as tenure and promotion criteria.
- **Policies, procedures, communication.** The Review Team expressed concern that there may not have been enough departmental meetings and time for discussion over the past several years. It recommends greater participation of faculty at departmental meetings and stronger adherence to departmental policies and procedures, and respect for the constitution. The Department will ensure that there are sufficient department meetings to discuss the many issues defined in the review document in addition to the normal maintenance and upkeep of the Department.

#### 3.2 Resource implications (if any):

None.

#### 3.3 Expected completion date/s:

The Department will revise its constitution by May, 2012, and will encourage discussion and communication on an ongoing basis.

### 4. WORKING ENVIRONMENT

#### 4.1 Action/s(what is going to be done) :

- **Space.** The Review Team noted that with the expected growth of Earth Sciences, instructional space will become an increasing concern. To alleviate this problem, it suggested that an additional, nearby room be transferred to Earth Sciences. The Review Team also recommended that our Department endeavour to share a seminar room with Computing Science. It also recommended that Earth Sciences procure space for discussion and collaboration among graduate students and faculty. The Department of Earth Sciences recognizes that instructional space is fast becoming an issue, and that increased lab sections are causing congestion in our labs. A specific, nearby room in TASC-1, which is seldom used by the current occupants, would serve to alleviate the need currently faced by the department for additional instructional space. Additionally, EASC would benefit greatly from a formal sharing arrangement of a seminar room in TASC-1 with another department. Procuring a room for coffee and discussion would also benefit the department, and we suggest that the carpeted foyer that lies between our banks of offices (adjacent to our meeting room, 7401), should be enclosed (while preserving public access to the adjoining doorway) and transferred to Earth Sciences. The Department is willing to work with the Dean of Science and other elements in the university to bring about changes to its space situation, but realizes that such arrangements would likely need to be implemented at the level of the Vice Presidents.

- **Equipment.** The Review Team recognized the Department's need for a new bus and additional petrographic microscopes in the near future. Both items will cost tens of thousands of dollars; these amounts are presently well beyond the levels of discretionary spending in the Department's annual operating budget. The Review Team recognized that private funding may be obtainable, particularly for the bus. The Department concurs with the Review Team that a new bus and new microscopes will soon be needed. The Department will monitor the situation and place a request for funding with the Dean of Science, hopefully before the situation becomes critical. The bus is currently in working order but requires repair with increasing frequency. It is beginning to burn more oil than is generally considered acceptable. The Department will explore the possibility of obtaining private funding to augment University funding.

**4.2 Resource implications (if any):**

Additional space will be needed to meet the increasing demands of teaching and research. Replacing the bus and purchasing new microscopes will cost as much as \$200,000.

**4.3 Expected completion date/s:**

The issues of space and equipment will be reviewed. We will keep the Dean of Science apprised of the bus's condition, our microscope needs, and the prospect of private donations.

## **5. Planning Exercises**

**5.1 Action/s:**

- **Strategic Plan.** The reviewers identified a need for a strategic plan that would include a discussion of research directions and future academic hiring. A departmental Strategic Plan will be developed in concert with three main exercises: revision of the undergraduate curriculum, enhanced collaboration with other academic units and agencies, and adjustment of the departmental constitution. The plan will articulate a vision for the next several years and serve as a foundation for the next departmental three year plan (due in 2012). The Strategic Plan will establish future research directions and hiring priorities. It will also provide a clear view of how Earth Sciences will continue to serve the needs of students, contribute to the academy, and link effectively with the broader community.

**5.2 Resource implications(if any):**

Development of the Strategic Plan, and the items from which it derives, will require extensive discussion with the entire department. The process would be facilitated by a series of half-day or full-day planning events, one or more of which could take the form of a retreat.

**5.3 Expected completion date/s:**

The Strategic Plan will be the culmination of discussions and decisions made in the areas of teaching, research and administration, and will be finalized toward the end of the Action Plan interval. Issues regarding the undergraduate curriculum will be initially dealt with by the departmental Undergraduate Curriculum Committee in the Fall Semester of 2011, and then brought to the department for further input. Discussions regarding research directions and hiring priorities will likely commence at special departmental meetings in the Fall Semester of 2011 and extend into the Spring Semester of 2012. The outputs from these exercises and other discussions will be shaped into a comprehensive Strategic Plan late in the Spring Semester of 2012.

The above action plan has been considered by the Unit under review and has been discussed and agreed to by the Dean.

<p>Unit Leader (signed)</p> <p><i>James MacEachern</i></p> <p>Name <u>JAMES MacEACHERN</u> Title <u>Professor + Chair</u></p>	<p>Date</p> <p><u>Sept 08, 2011</u></p>
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## Section 2 - Dean's comments and endorsement of the Action Plan :

The Department of Earth Sciences is to be congratulated on the very positive nature of the External Review and on their well-developed Action Plan. This process comes at an opportune time since it aligns with many of the planning initiatives that we are starting to set in motion in the Faculty of Science, specifically:

- examination of curriculum at both the undergraduate and graduate levels;
- reassessment of undergraduate degree programs;
- development of fiscally-sustainable faculty and staff hiring plans;
- development of a workable space plan;
- analysis of optimal graduate student numbers (in light of changes at NSERC, the end of BC government build out of graduate student numbers, and a cost-benefit analysis of TAships);
- examination of how to preserve, prioritize and augment non-salary operating budgets in the face of anticipated university budget stasis in the coming decade.

Many of the solutions that we develop as a Faculty will be informed by, and will inform, the Earth Sciences Action Plan outlined here. However, I recognize that the Department of Earth Sciences has special needs. In particular, it has the challenge of recruiting undergraduate students given the lack of exposure to this discipline at the high school level. I and my staff will be happy to assist the department in its recruitment and retention efforts.

As acknowledged in the departmental Action Plan, several items will require or will be facilitated by decanal level discussions. I will work with my colleague in the Faculty of Environment to encourage productive interactions between Earth Sciences and Geography on the subject of undergraduate curriculum development and revision. I will discuss the space needs of Earth Sciences (specifically TASC1 7000) with my colleague in Applied Sciences. I have already started discussions with the Dean of Graduate Studies on the matter of graduate student numbers and graduate student funding.

I strongly endorse the recommendation that the department develop a strategic plan and, indeed, I will be expecting the other seven departments in the faculty to develop their own plans and participate in development of a strategic plan for the Faculty. Allocation of resources should always be contingent on well-developed plans.

Faculty Dean



Date

9 Sept 2011