CARLETON UNIVERSITY COMMITTEE ON QUALITY ASSURANCE

Cyclical Review of the joint graduate programs in Earth Science Executive Summary and Final Assessment Report

This Executive Summary and Final Assessment Report of the cyclical review of Carleton's joint graduate programs in Earth Science are provided pursuant to the provincial Quality Assurance Framework and Carleton's Institutional Quality Assurance Process (IQAP).

EXECUTIVE SUMMARY

The joint graduate programs in Earth Science reside in the Ottawa-Carleton Geoscience Centre, a unit administered by the Faculty of Science. This program is offered jointly between the University of Ottawa and Carleton University.

As a consequence of the review, the programs were categorized by Carleton University's Senate Quality Assurance and Planning Committee (SQAPC) as being of good quality. (Carleton's IQAP 7.2.13).

The External Reviewers' report offered a very positive assessment of the programs. Within the context of this positive assessment, the report nonetheless made a number of recommendations for the continuing enhancement of the programs. These recommendations were productively addressed by the Director of the Ottawa-Carleton Geoscience Centre, the Deans of the Faculty of Science (University of Ottawa and Carleton University) and the Dean of the Faculty of Graduate and Postdoctoral Affairs in a response to the External Reviewers' report and Implementation on Plan that was submitted to SQAPC on April 14, 2022.

Ottawa-Carleton Geoscience Centre Response to External Reviewers' Report & Implementation Plan Programs Being Reviewed: Graduate Programs

Note: This document is forwarded to Senate, the Quality Council and posted on the Vice- Provost's external website.

Introduction & General Comments

The site review of the OCGC occurred in the last week of February 2021 and the OCGC Board of Management received the External Reviewers' report on March 30, 2021. Under the current constitution of the OCGC, the Board of Management has the responsibility to maintain and ensure improvement of the graduate programming as part of student, post-doctoral, staff, and faculty experience in the Department of Earth Sciences (Carleton University), Department of Earth and Environmental Sciences (University of Ottawa), and for science-based physical geography faculty/graduate-student cohorts from the two geography departments in each institution. The OCGC is also an institution involving participation of adjunct faculty who are employed by agencies outside of the academic institutions (e.g., federal government, industry). The report was shared with members of the OCGC at both institutions, and this response and implementation plan arises from comments received from these cohorts and discussion amongst Board members who represent OCGC cohorts.

The External Reviewers' report was positive overall and recognized the continuing excellence in scholarly output, level of research infrastructure, and growing breadth of expertise of an institution that is relatively unique in its structure on the Canadian tertiary-education landscape; that is, faculty/student/staff cohorts of four departments divided among two faculties in two different universities. However, the report underscored internal problems associated with the OCGC: administration (given increasing independence of student governance among academic units and their universities), communication within the organization, and faculty and student engagement with respect to the increased diversity of science and little to make all members feel part of a research-based working community. The review recommended increased university funding to support several OCGC initiatives that will improve administration (e.g., documentation of enrolment, publications, research funding, etc.) and communication (website), for both within and external to the OCGC, all of which will also greatly benefit both institutions by drawing attention to the academic/research excellence of the OCGC and promote student recruitment.

This document contains both a response to the External Reviewers' Report and an Implementation Plan (Section B) which have been created in consultation with the Dean(s).

In summary, significant proposed changes include:

transformation from an inter-university administrative body dealing with academic programming (a state out-of-date due to increased independence of inter-institutional student governance) to a working community (academic, industry, government) of scientific scholars (professors, adjunct faculty), scholars-in-training or HQP (ie, graduate students, PDFs), and support staff (administrative, technical) enabling enhanced sharing of resources related to research, teaching and student-research governance (e.g., research and defense committees). This transformation remains within the institutional joint-institute framework of Carleton University and University of Ottawa. Membership is governed by scientific interest in the earth and environmental sciences and accommodates individuals with recognized standing affiliation with a department in either university. A bilingual website independent of OCGC department cohorts, but linked to their university websites, will be the centerpiece for communication and promotion of the OCGC both internally and externally. Required institutional financial support will underwrite OCGC administration (e.g., tabulation of enrolment, publications, research funding, etc.) as well as activities to increase student engagement. Student support will involve delivering greater awareness of academic regulations, research infrastructure, and scientific diversity of the OCGC; delivery and increased accessibility to scientific fora (including courses emphasizing multi-discipline topics) designed to support and promote innovative multi-disciplinary research; and a call on departments represented in the OCGC to establish (or maintain) "living wage" funding packages for students to enable equity in accessibility for graduate school. The OCGC will draw on its membership to develop EDI protocols that will be driven by evolving university and department initiatives.

For each recommendation one of the following responses is selected:

Agreed to unconditionally: used when the unit agrees to and is able to take action on the recommendation without further consultation with any other parties internal or external to the unit.

Agreed to if additional resources permit: used when the unit agrees with the recommendation, however action can only be taken if additional resources are made available. Units must describe the resources needed to implement the recommendation and provide an explanation demonstrating how they plan to obtain those resources. In these cases, discussions with the Deans will normally be required and therefore identified as an action item.

Agreed to in principle: used when the unit agrees with the recommendation, however action is dependent on something other than resources. Units must describe these dependencies and determine what actions, if any, will be taken.

Not agreed to: used when the unit does not agree with the recommendation and therefore will not be taking further action. A rationale must be provided to indicate why the unit does not agree (no action should be associated with this response).

UNIT RESPONSE AND IMPLEMENTATION PLAN						
Programs Being Reviewed: Graduate programs in Earth Science						
Prepared by (name/position/unit): Dr. George Dix, Past-Director, OCGC						
External Reviewer Recommendation & Categorization	Unit Response: 1- Agreed to unconditionally 2- Agreed to if additional resources permit (describe resources) 3- Agreed to in principle 4- Not agreed to Rationales are required for categories 2, 3 & 4	Action Item	Owner	Timeline	Will the action described require calendar changes? (Y or N)	
1. Weakness: Historically the OCGC provided a nexus of research and graduate training. The two units provided joint access to resources, infrastructure and networking for two small departments. Unfortunately, with continued expansion and diversity of interests over the last 10 years, the OCGC structure has not evolved with changes in research scope and diversity of interests across both departments. The rationale on paper behind the formation of the units is sound, for some but in practice, the OCGC does not seem to represent the interests of the entire research community.	1. Agreed to unconditionally Weakness arises from self (OCGC) and external factors: (a) loss of a coherence among members that the Centre is a locus of scientific expertise and the breadth of earth and environmental sciences; and (b) increased administrative independence of OCGC subunits due to changing priorities of university/department-centric (rather than joint-institute) administration and funding 2. Agreed to if additional resources permit Guaranteed funding of the OCGC is required to address the second (b) element of the defined weakness.	A set of changes carried out unconditionally by the Centre are listed below but parallel to this, and critical for the OCGC to achieve its objectives, is (as defined by reviewers) need for a renewed collaboration of mid- and upper-level admin between the two universities to establish improved financial support (i.e, OCGC as a line item in each of the two geoscience dept budgets) and recognition for the Joint Institute framework administered by Carleton University and University of Ottawa.	OCGC, Carleton and UOttawa senior admin	Action is already underway but also scheduled to carry through to July 2022 (see below)	One item will involve calendar changes likely by 2025 (see below)	
2. Opportunity: Given the excellence, diversity of research of the faculty, adjuncts, and genuine support from the graduate student population represented across the two units, now is the time to implement a "strategic vision" that implements positive changes to reflect this diversity; this is low hanging fruit that can be achieved through simple modifications	Agreed to unconditionally Agreed to if additional resources permit	1. Agreed to unconditionally (a) a "mission" statement exists but a new constitution defining the Centre's vision, EDI, activities and responsibilities, membership, and administrative practices is required; (b) telephone/email list circulation to all members	For 1. OCGC	1: a) for June 2022 b) for Sept 2021	No	

to the current structure involving 1) higher visibility via redesigned combined web portals 2) creating stronger communication links (i.e. email listserv) 3) more support and recognition from the upper and mid administration units towards resources needed to fulfill and maintain the student experience.		2. Agreed to if additional resources permit Some changes require guaranteed annual funding for the OCGC (ie., line items in budges of the two geoscience departments) with support and recognition from upper and mid admin of the universities: a) OCGC website (3 rd party site) as portal of communication within and external to the two institutions b) administrative support for data management and its distribution; c) funding for OCGC activities to enhance the student experience (1-day orientation Fall retreat; PDAC activities; workshops; support for student-initiated events)	For 2. Inter- institutional discussions required at Dean and higher levels	2. for new budget year, 2022	
3. Opportunity: When a new website is developed for the OCGC, it can include a list of faculty and adjuncts by disciplinary area to assist prospective and current students in finding people of shared interests to facilitate interaction.	Agreed to unconditionally Agreed to if additional resources permit	for 1: OCGC provides information for a website for 2: purchase of a domain name and costs to set-up and maintain the website (including a bilingual format); the website needs to be hosted independently of both institutions to ensure rapid changes and minimize bureaucratic delays	Co-share: 1: OCGC, 2: institutional funding (Carleton, UOttawa)	1: for new budget year, 2022	No
4. Weakness: The role of the Centre, and therefore also of its Director, are not well-defined. Without explicit administrative support (allocated time) for the Director or supporting administrators, the Centre is very limited in its activities.	Agreed to unconditionally Agreed to if additional resources permit	For 1. Re-write the OCGC constitution: the OCGC will be a community of scientific scholars and provide access to research and teaching resources and will share in student-research governance. Membership will include any scholar (and student) formally affiliated with either institution with an interest in earth and environmental sciences.	1. OCGC 2. institutional funding (Carleton, UOttawa)	 for June 2022 for May 2022 new budget year) 	No

			For 2. Stable funding is required to maintain accurate annual collation of OCGC data related to student and faculty activities in order to provide up-to-date information for student recruitment purposes.			
5.	Weakness: Communication within the OCGC was identified by all parties as seriously lacking. The Centre has no website and no email list. Essential communications are not shared across the Centre membership and this is a huge impediment to participation and access for graduate students.	Agreed to unconditionally Agreed to if additional resources permit	See #2 and 3 (above)	See #2 and 3	See #2 and 3	No
6.	Opportunity: A trusted faculty member appointed as an ombudsperson to hold confidential nonbiased listening sessions is recommended.	4. Not agreed to The joint-institute structure with members across two faculties and four depts precludes an individual acting as an ombudsperson with whom everyone will feel comfortable. Existing methods are viewed as reasonable alternatives.	Fall orientation and website information will define available resources in each dept and institution that a student can use for advice/consultation. In successive order of likelihood: peers, advisor, other faculty in dept; dept grad advisor, Chair, Dean's Office or University services, University Ombuds office	OCGC and institutional services (Carleton, UOttawa)	for Sept 2021	No
7.	Weakness: New faculty in both departments would clearly benefit from more formalized mentoring and onboarding, which would also strengthen relationships within the departments and the OCGC.	3. Agreed to in Principle Time for faculty mentoring takes away from existing time required for teaching, admin, and research; additional funding (e.g., course/admin release) might be a solution but it will be specific to a dept/university, not OCGC.	The OCGC calls on the two universities to make mentoring a priority and provide necessary funding to departments to help new faculty or faculty needing to change research directions mid-career	Dept/ university input required (Carleton, UOttawa)	n/a	No
8.	Weakness & Opportunity: For faculty, adjuncts and students from across the breadth of the disciplines to feel ownership of the OCGC, it's essential that the OCGC confirm and support the increasingly broad scope of science that is included in geoscience. The currently proposed actions to increase community (e.g., introductory	Agreed to unconditionally Agreed to if additional resources permit	For 1 and 2: Some OCGC activities below can be carried out without funding, others require annual funding (currently not formally defined at UOttawa, but in place at Carleton). Action items: a) 1-day Fall orientation for grad students, with tours of joint facilities (cost: bus rental,	OCGC, with institutional (Carleton, UOttawa) funding for field trips	For req. funding: Budget year 2022 others, Sept 2021 with exception of (f) which will	No, except for (f) but not until 2025

field trip, required geoscience core components in curriculum) could backfire if they communicate a more narrow, historical view of the disciplines. This is an opportunity to survey the community at large perhaps have a "joint faculty retreat" to discuss field trip options, and alternative strategies that reflect the broad and overlapping interests for the two units.		(b) Fall field excursion, Winter lab excursion (bus rental) (c) OCGC Social event after/during OCGC Grad Student Seminars (2x per year) (d) Prospectors Developers Assoc. Can (PDAC) - premier annual event for earth and environmental science bringing alumni now in govt and industry together with OCGC members (costs: social event with rental) (d) OCGC Seminars (1 per month addressing big topics of interest across earth and environmental science) (no cost) (e) increased communication and accessibility to all other types of seminars in OCGC (no cost) (f) establish multi-discipline focused courses that address integration of diverse subjects		require at least 2 years development	
9. Concern: For faculty and adjuncts not automatically included in the OCGC as members of participating departments, the criteria and pathway for membership must be formalized and clearly communicated.	1. Agreed to unconditionally	Re-writing of the OCGC constitution (which is out-of-date): namely, membership is automatic if individual is related to research and training of earth and environmental science and has a defined affiliation (student, faculty, adjunct, staff) with either university. The proposed website will act as communication to recruit both students and faculty/govt/industry researchers.	OCGC	for June 2022	No

10. Opportunity: To establish and strengthen networks within each department and across the OCGC, formalize structures for introducing people to one another, especially new people joining the Centre.	1. Agreed to unconditionally	Increased awareness of OCGC through communication (website, report of activities in each dept's meetings; formally defined Assoc Director in geoscience dept that does not host the Director to enable cross-dept communication; increased communication and social interactions in general – see #8)	OCGC (assumed with funding – see #8)	for Sept 2021 and new budge year, 2022	No
11. Opportunity: Establish communication between the two units via combined web portal, up to date list of members, and email listserv.	Agreed to unconditionally Agreed to if additional resources permit	See #2, 3, 5 (above)	See #2, 3, 5 (above)	See #2, 3, 5 (above)	No
12. Opportunity: We note in section H, there is a proposal to require some kind of disciplinary "geoscience" core through courses or seminar attendance. To make sure that this does not elevate the traditional geoscience disciplines as more important than other member disciplines, students with a traditional geoscience background should also be supported in taking courses in the more broad, modern scope of what constitutes geoscience (physics, programming, biology, chemistry, etc). Validating the breadth of disciplines in the OCGC this way may help support the engagement of currently disengaged members.	1. Agreed to unconditionally	Since the report, a revised approach: a) expansion of current knowledge and breadth of expertise will be carried out using seminars. The OCGC Seminar will include only broad-based presentations illustrating integrated nature of earth and environmental sciences. b) communicate schedules and increase accessibility to more informal (or topic specific) seminars and talks in departments with OCGC members	OCGC	for Sept 2021	No
13. Weakness: Students 2019 satisfaction survey shows significant dissatisfaction with both MS programs and with the Carleton PhD program. The analysis provided in the self-study attributed low satisfaction mostly to external factors such as career uncertainty. Perhaps this is an area where career opportunity workshops could be implemented. The analysis also showed a level of frustration with Carleton student	1. Agreed to unconditionally Low approval ratings (for Carleton) and ~50% approval ratings for MSc at both institutions require explanation. For the MSc rating, the survey did not explore whether students' expectations of the research environment matched their career interests.	Prior to submission of the external reviewers' report, Carleton ERTH moved to solicit involvement of the Carleton Ombuds Office to engage graduate students in discussion about the origin of the poor satisfaction level associated with Carleton ERTH (PhD). The Ombuds Office carried out its survey during April-June 2020, and the	(1) Carleton (Dept of Earth Sciences)	(1) ongoing since Apr 2021	No

success rates dealing with financial aid (e.g., failure to respond to aid opportunities in a timely manner. The report states that the department is investigating the reason for this, but we saw no plan in place.		department is still waiting for the report due to delays arising from within the Ombuds Office (written communication to department Chair from Ms. Melanie Chapman, Ombuds Office, Nov 2021). Once the report is received, there will be continued work with the Ombuds Office to determine the best approach to resolve student concerns and determine how annual assessments can be conducted. This work could startby January 2022.		(2) by 2022 (if deemed necessary)	
14. Weakness: Both institutions should confirm a minimum support level for all enrolled students in full-time studies to meet appropriate standard of living. Enforcement in each department is necessary.	3. Agreed to in principle Current range in funding is influenced by differences of institutional funding mechanisms and available funding from faculty. However, continued funding must be considered in comparison to rising living costs; e.g., constant rising accommodation costs. Carleton University provides estimate of \$18k per year for minimum graduate-student living costs in Ottawa. UOttawa (Dept Earth and Environ. Science): guaranteed funding is \$21k per student; note – most students have University tuition fee waivers thereby enhancing this level of funding. Carleton (Dept of Earth Sciences): TA and max scholarship funding meets living std estimate BUT DOES NOT cover tuition costs (\$12k) that is covered by an RA and-or student.	The OCGC will ask its member departments at Carleton to urge faculty to enable funding that covers the ~\$12k differential. However, this depends on research funding to the faculty member. This may also require rethinking of institutional support at both universities	Individual research professors and institutional funding (Carleton, UOttawa)	ASAP	No

15. Weakness: Both institutions should	1. Agreed to unconditionally	This recommendation dealt with	OCGC (each	for Jan 2022	
recommit to enforcement of milestones and	1. Agreed to unconditionally	enforcement of milestones and early	Dept cohort)	JOI 3411 2022	
early establishment of advisory committees.	This refers to often delays or delinquent	establishment of advisory	Dept conorty		
Enforcement in each department is	responses of MSc and PhD milestone reviews.	committees to ensure timely student			
necessary.		academic progress. Criteria for student			
		advancement within			
		their programs at OCGC include (1)			
		university requirements for academic			
		advancement required			
		of students through online documentation			
		(i.e., requirements for research			
		proposals/statements,			
		timelines, milestones, annual progress			
		reports, etc.) combined with discussion			
		with their			
		advisors; and (2) an OCGC-specific			
		requirement; the graduate student			
		seminar. The identification of a			
		"deliverable" that was requested for			
		January 2022 will be that the OCGCwill			
		ask each department:			
		a) to mainform the existing timeding			
		a) to reinforce the existing timeline framework of student advancement, to			
		reiterate to facultyand students alike at			
		time of enrolment the importance of			
		clear definition and expectations of			
		research (and related course work),			
		written documentation of expected			
		research product and timelines, and			
		involvement of an advisory committee;			
		(b) to have regular meetings between			
		advisor/advisory committee and			
		student, and quicklyidentify problems			
		that may require intervention of			
		departmental/university administration			

46. On a set unit u Detter web convec entation of		c) timely submission of required term (Carleton) and annual (UOttawa) formal assessments of progress. d) to reinforce the significance of the OCGC Graduate Student Seminar as a utility for development of the individual as a researcher and ensure the established deadlines are respected. The two chairs of the earth sciences departments will confirm with the Director (OCGC) by end of January 2022 that this has been discussed at a departmental meeting, and information has beenpassed to all graduate students. The OCGC's late Spring and late Fall meetings of the Board of Directors (often in conjunction with a day of OCGC Graduate Student Seminars) form regular venues to ensure that such revitalization of timeliness in progress advancement is working.			
16. Opportunity: Better web representation of the OCGC may help attract a larger and more diverse applicant pool for the graduate programs as well as help the current student population connect across the OCGC.	Agreed to unconditionally Agreed to if additional resources permit	See #2, 3, 5, 11	See #2, 3, 5, 11	See #2, 3, 5, 11	No

17. Weakness: Insufficient orientation and introduction to people and facilities may be limiting students' abilities to access OCGC resources. If the current mode of communication is recognized as ineffective, it behooves the leadership/administration to try other modes.	Agreed to unconditionally Agreed to if additional resources permit	For 1. Establish a 1-day Fall orientation meeting for all graduate students, providing tour of research facilities at both institutions, meeting with faculty, adjunct faculty, and staff, and including social engagement; also, establish a per-semester meeting of dept. grad supervisors with students as a "check-in". For 2. a) Moving members of the OCGC (100+ people) around for the day requires guaranteed funding for bus rental b) advertisement of people and facilities via website is the most efficient.	OCGC, institutional funding (Carleton, UOttawa)	For Sept 2021	No
18. Weakness: Poor communication and uneven response to feedback has resulted in an erosion of trust. External mediation or the use of an ombudsperson role may be an effective mechanism for understanding the strong messages already revealed by student feedback. This is most urgent at Carleton.	1. Agreed to unconditionally	See #13	OCGC	already initiated	No
19. Weakness: Uneven application and enforcement of checkpoints appears to be allowing some MS students to function without adequate advising and progress support.	1. Agreed to unconditionally	See #15: establish (if possible) even approach among sub-unit cohorts	OCGC	for Jan 2022	No
20. Opportunity: The proposed relaxation of proposal approval (Volume 1 p. 41) would likely exacerbate the problem of students lacking feedback and support. Establish a mentor program for incoming students and exit poll strategy; this would be useful for tracking alumni also.	3. Agreed to in principle This specific reference relates to MSc research proposal vs research statement (Carleton, ERTH). Debate involved that the proposal took too much time when compared to the available 2-yr University funding window	Re-evaluation of academic success of students who submit MSc statements vs proposals; reinforce milestones, increase communication to students (e.g., Fall orientation) as in #15	OCGC	for Jan 2022	No

21. Opportunity: A general analytical methods course should be made available to graduate students (similar to what is already offered to undergraduates) so that they are better able to take advantage of the OCGC facilities.	3. Not agreed to Courses (MSc=3, PhD=2) are usually focused on specific topics required by student.	Available research infrastructure will be covered in the 1-day orientation day for all graduate students (see #17); need for specific research tools would be established by an advisory committee (see #15); website information will provide 1-stop-evaluation of what is available	n/a	n/a	No
22. Weakness: Insufficient administrative resources for core functions of the Centre are contributing to poor communication and weak coherency of the Centre.	2. Agreed to if additional resources permit This has been a longstanding (now 3 cyclical review reports) issue directed to mid- and upper level institutional administrators.	Establish requirements for administrative support related to core functions of the OCGC: - website, annual collation of critical data about OCGC operations/success (e.g., enrolment, graduation, exit poll evaluations, publications, research funding, etc.)	Inter- institutional support is essential (3 rd OCGC review report requesting such support)	for July 2022	No
23. Opportunity: Each department, and OCGC, should maintain a website which includes available tools and facilities, available training, contact information, pricing, and instructions for gaining access.	Agreed to unconditionally Agreed to if additional resources permit	See #2, 3, 5, 11	See #2, 3, 5, 11	See #2, 3, 5, 11	No
24. Opportunity: Formalizing the mechanism of joining the OCGC, recognizing new membership with meaningful introductions, and creating opportunities for developing relationships would greatly improve the faculty and adjunct experience, and thereby, the graduate student experience in the OCGC.	Agreed to unconditionally Agreed to if additional resources permit	See #2, 3, 5, 11	See #2, 3, 5, 11	See #2, 3, 5, 11	No
25. Opportunity: We recommend that units agree on a unified EDI plan which would apply to hiring and student recruitment.	1. Agreed to unconditionally	Establish an EDI plan in discussion with members and that is compatible with evolving plans within both universities. a) one component already defined: seek equity in funding and meeting minimum funding	OCGC, Carleton, UOttawa	over the next few years in step with the universities and departments	No

	needs for students to increase graduate-school accessibility for diversity of economic and social backgrounds, gender, and race.		