

**Policies and Guidelines for Graduate Studies in the
School of Environmental Sciences
University of Guelph**

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1. Introduction

Welcome to graduate studies in the **School of Environmental Sciences (SES)**. This document describes the graduate programs offered by SES, admission and program requirements, student funding sources and regulations for graduate students in SES. Please note that SES abides by policies and guidelines for Graduate Studies at the University of Guelph outlined in the [Graduate Calendar](#). Students and faculty should be familiar with the content of the following graduate calendar policies: Responsibilities of Advisors, Advisory Committees and Graduate Students, Graduate Student-Advisor Mediation Procedures, Student Rights and Responsibilities, Degree Regulations. This document outlines policies and guidelines that are specific to the SES.

The graduate program in SES is the responsibility of all graduate faculty, staff and graduate students, and administrative activities are coordinated through the Graduate Program Committee within the School. The [Graduate Program Assistant \(ses.gradsec@uoguelph.ca\)](mailto:ses.gradsec@uoguelph.ca) and [Associate Director \(Graduate Studies\)](#) are responsible for overall coordination of graduate studies within the SES. All general inquiries on graduate studies within the SES can be directed to them.

The **SES** was formed in 2009 by the merger of the Departments of Environmental Biology and Land Resource Science and is an academic unit within the Ontario Agricultural College (OAC) at the University of Guelph. The School includes an interdisciplinary group of scientists teaching and conducting research into biological, physical, and chemical processes, and their interactions in the environment.

These research interests are reflected in undergraduate and graduate courses offered by SES. Funding is primarily provided by the Ontario Ministry of Training, Colleges and Universities, the Ministry of Agriculture and Food, and Ministry of Rural Affairs; and from a wide variety of other sources, including competitive grants and research contracts. The School cooperates with several agencies on international programs.

Through its close ties and cooperation with federal and provincial research groups and industry, the School also makes use of expertise available in other organizations, through appointment of Adjunct, Associate and Special Graduate Faculty to serve as members of graduate student Advisory Committees.

2. Degrees and disciplines offered

The SES offers thesis-based degrees of Master of Science (MSc) and Doctor of Philosophy (PhD) degrees, and course-work based degrees of Master of Environmental Sciences (MES) and Graduate Diploma in Environmental Sciences (GDip). The MSc and PhD degrees are also offered through two collaborative programs: the Toxicology Program and the International Development Studies Program. Please consult the graduate calendar for details on the collaborative programs.

2.1 Graduate Diploma

The GDip in Environmental Sciences is a two-month program that will develop your skills in field and lab techniques for soils, forests, wetlands and aquatic systems. The goal of the GDip is to provide practical and hands-on learning experience so that you can excel in a career with industry, government, consulting, or the not-for-profit sector. The GDip consists of four graduate courses taught over eight weeks in May and June:

- Soil Survey and Interpretation
- Forest Ecosystem Patterns and Processes
- Biogeochemistry of Wetlands
- Classification and Assessment of Aquatic Systems

2.2 Master of Environmental Sciences

The MES (coursework Masters) is a one-year program that provides the opportunity to study the most recent theoretical and technical advances and to strengthen one's fundamental knowledge in the environmental sciences. This is achieved through a blend of discipline-specific courses as well as broader theme-based courses where the multi-disciplinary breadth of environmental sciences is explored. The MES program is also designed to promote critical thinking and enhance oral and written communication. This graduate experience will prepare students to take on leadership roles in public, private and non-profit sectors to find solutions to Canadian and global environmental questions. The MES allows students to choose from two options: 1) courses + research project (students take six courses) and 2) courses-only (students take 8 courses). Under both options, the program can be completed in 12 months or less.

2.3 Master of Science

The objective of the MSc program is to develop and train graduate students that possess a high level of knowledge in the field of environmental science, expertise in specific aspects of environmental science (their thesis research focus), training in laboratory and field techniques, and excellence in writing and oral communication. With these skills, MSc students will possess a strong foundation on which they can be highly successful in science-related positions in government, industry, and consulting, or carry out high quality research at the PhD level.

2.4 Doctor of Philosophy

The objectives of the PhD program are to develop highly competent, independent, creative, and critical scientists. Doctoral students of the SES Graduate Program will provide leadership as scholars in academic institutions, as managers and officers in the industrial research and development sector, research and policy branches within the government sector and in other social institutions. Research in the PhD program is expected to be original and novel, contribute significantly to the relevant research field, and published in high-quality peer-reviewed journals.

The PhD degree is offered in the following Fields of Study:

- Earth and Atmospheric Science
- Ecosystem Science and Biodiversity
- Plant and Environmental Health

3. Schedule for application

Prospective students may apply to the graduate program of the SES at any time but may enter graduate programs only at the start of a semester as per the schedule listed in Table 1. Please keep in mind when applying that processing graduate applications from Canadians and landed immigrants can take 6-8 weeks.

International applicants should allow at least six months for the completed application to be considered to provide time to apply and receive authorization to study in Canada if accepted to a graduate program at the University of Guelph. Students should consider the time required to apply for scholarships, assemble the required transcripts, letters of recommendation, and, where applicable, scores for standardized examinations (e.g., TOEFL or IELTS). Applicants should make arrangements to take one of these tests in advance of applying. Ample time should be allowed for the results of these tests to reach the University of Guelph.

Table 1. Schedule of entry dates by degree program for the School of Environmental Sciences

Degree	Entry Semester		
	September	January	May
GDip			X
MES	X		
MSc	X	X	X
PhD	X	X	X

4. Admission requirements

The Graduate Program Committee (chaired by the SES Associate Director, Graduate Studies) has primary responsibility for determining the admissibility of applicants to graduate programs within the School.

Before applying to the thesis-based programs (MSc and PhD), students are strongly advised to obtain the support of a faculty member willing to serve as their thesis Advisor. This will expedite the processing of their application and ensure that a potential applicant has thoroughly investigated the feasibility of graduate work in the SES prior to submitting an application. This saves the applicant time and money, and reduces the investment of time by faculty and staff in processing applications from students unlikely to be admitted because of space and resource constraints.

The University and the SES require documentation of proficiency in English. If English is not the student's first language, students will be required to submit the results of a standardized language test. Please refer to <https://www.uoguelph.ca/graduatestudies/future/international> for details on the acceptable tests and minimum scores required.

4.1 GDip, MES and MSc Programs

The School's admission standard for the MSc, MES and GDip programs is the same as the University and requires a four-year, honours science degree with a minimum B- (70-72%) average during the final two years (4 semesters) of full time undergraduate study. Meeting the minimum requirement (B-) does not guarantee automatic entrance; depending on other criteria (e.g., letters of reference, standardized test scores, academic background relevant to the area to which the applicant has applied) students may be considered for admission with provisional status. Students on provisional status must obtain a 'B' average (70%) in at least two graduate courses during their first two semesters of study to continue in the program. Provisional students will be funded at the same level as regular students (please see below).

4.2 PhD Program

Admission to the PhD program is generally restricted to students with a recognized MSc degree in a related field obtained with a minimum academic standing of 'A-' ($\geq 80\%$) in their postgraduate studies. In some cases, students from non-traditional MSc programs (e.g. MES) will also be considered. Students who meet the minimum University requirement (73-76%) but not the School requirement ($\geq 80\%$) may be considered for admission with provisional status (please see below). Students on provisional status must obtain an 'A-' ($\geq 80\%$) average in at

least two graduate courses during their first two semesters of study to continue in the program. Provisional students will be funded at the same level as regular students. In exceptional cases, students may enter the PhD program directly from a B.Sc. if they have the minimum requirements as defined by Office of Graduate Studies of the University of Guelph.

4.3 Transfer from Masters to Doctoral Program

Students who are currently enrolled in the MSc program or who are enrolled in the MSc program at Guelph and have an MSc that is not recognized by the University of Guelph are encouraged to consider transferring to the PhD program. As the decision to transfer to a PhD may hold a number of personal and professional implications, it should not be taken lightly. Students are encouraged to discuss this with their Advisor, the Associate Director for Graduate Studies, and/or their colleagues.

Things for students and advisors to consider before making a decision:

1. Career plans and how an MSc or PhD will serve as preparation or foundation for this career.
2. Scope of current research project and whether it is more suited for an MSc or PhD degree and how it can be expanded to a PhD project.

Weigh the option of a) finishing current project at the MSc level, and broaden one's expertise by embarking on follow-up research at the PhD level, versus b) continuing with current project but in greater depth to achieve PhD.

In order to complete a transfer, the following are required:

1. The student must apply during Semester 3 or 4 of their MSc program.
2. The student must have a good quality undergraduate degree (normally B+ to A, with an average mark of $\geq 77\%$ for the last 4 semesters).
3. The student must have completed at least 1.0 graduate level course credits (two 0.5-credit graduate courses), plus ENVS6900 Research Seminar in Environmental Sciences recognized for credit at the University of Guelph, with an average of at least A- ($\geq 80\%$).
4. A statement from the Advisory committee concerning research potential is required. This statement is in the form of a letter signed by all of the members of the Advisory committee. This statement must address the following:
 - a. How the MSc project is to be extended to provide the breadth and the depth of scholarship that is expected of a PhD

- b. How the additional time required by the student to complete the PhD program is to be funded.
- c. Documentation of productivity, such as:
 - i. Papers published, accepted, or submitted to peer-reviewed journals.
 - ii. Publication of technical reports of scientific work.
 - iii. Presentations of research work at national or international scientific meetings.

This package is sent to the SES Graduate Program Committee and then the Director of the SES for approval. Once approved, the complete package is sent to Office of Graduate Studies with the following forms:

1. A doctoral funding form signed by the Advisor.
2. An Application for Transfer to another Program form. The transfer fee is payable when the application is submitted to Office of Graduate Studies.

4.4 Provisional acceptance

A student may be granted provisional acceptance to the graduate programs in the School of Environmental Sciences. Based on grades, letters of reference, or other information, the Graduate Program Committee may recommend that the student only be admitted on a provisional basis for up to two semesters.

Provisional acceptance will normally have the specific requirement that:

1. The student take two graduate (6000) level courses within the first two semesters and that they attain a grade of $\geq 70\%$ (MSc) or $\geq 80\%$ (PhD) in both courses, or the student take two graduate (6000) level courses in the first semester and that they attain a grade of $\geq 70\%$ (MES). Provisional status is not available for the GDip program.
2. The courses to be taken will be decided by the student and their Advisor(s) and specifically named in the letter of provisional acceptance.
3. The evaluation in these courses is by assignment of a numerical or letter grade and not “satisfactory/unsatisfactory”.
4. Any courses where the only form of assessment is a written paper or report not be marked or evaluated by the Advisor(s).

5. For thesis-based programs: that the student begin working on their thesis research and participate in research under the Advisor(s') direction.

At the end of the provisional semester(s) and after the marks for all courses are officially posted, the student's status will be changed to regular status if the grades for the assigned courses are $\geq 70\%$ (MSc, MES) or $\geq 80\%$ (PhD).

If these conditions are not met, the student will be asked to withdraw from the graduate program in the SES in accordance with "Procedures and Guidelines for Student Cases" of the Office of Graduate Studies of the University of Guelph.

5. Program requirements

5.1 GDip Program

5.1.1 Prescribed program of study and required courses

Students in the GDip program must complete a minimum of 2.0 credits comprised of four prescribed courses: ENVS6503 Biogeochemistry of Wetlands, ENVS6504 Classification and Assessment of Aquatic Systems, ENVS6505 Soil Survey and Interpretation, and ENVS6506 Forest Ecosystem Patterns and Processes.

5.1.2 Duration of program and funding

The GDip program is eight-weeks long, with the four required courses each taking two weeks for completion during May and June. Funding is not provided to students registered in the GDip program.

5.2 MES Program

5.2.1 Prescribed program of study and required courses

Candidates for the MES degree by course work must complete a minimum of 4.0 credits and have the option of completing 1) coursework plus project or 2) coursework only option. The required courses are two 0.5-credit courses, namely ENVS6501 Advanced Topics in Environmental Science (Fall semester) and ENVS6502 Seminar in Environmental Science (Winter semester). Students who select the research project option will take ENVS6500 Environmental Sciences Research Project, which is worth 1.0 credit. Although students may start to define their research project as early as the fall semester (see below), students will typically enroll in the research project course during the summer semester. ENVS6500 can be completed in the Fall or Winter semester for students wanting to complete the program in 8 months or for students taking courses in the summer. In this case, students should enroll in ENVS 6500 during the fall or winter semester. Note that you cannot stay enrolled in the ENVS 6500 course over all three semesters.

The remaining 2.0 (coursework plus project option) or 3.0 (coursework only option) credits can be obtained by taking SES courses that focus on such areas as Earth and Atmospheric Science, Soil Science and Environmental Biology or relevant courses from other academic units at the University of Guelph. For a current listing of courses and the semester in which they are offered, please contact the Graduate Program Assistant (ses.gradsec@uoguelph.ca). Students should discuss their course selection and/or research projects with the SES MES coordinator (see website for current coordinator).

5.2.2 Advisory Committee

The SES Graduate Coordinator and a member of the SES Graduate Committee will serve as the advisory committee for students taking the MES course-only option. Students in the course + project option will complete the required research project under the guidance of a faculty advisor. The advisor will be a faculty member of the University of Guelph, or an external advisor if the project will be completed as part of a placement with an approved non-academic agency. In the case of an external advisor, the student will have a co-advisor, who is part of the graduate faculty in SES. An additional faculty member will be selected and form the Advisory Committee in consultation with the student.

Preferably, the Advisory Committee should be established and should meet before the end of the student's first semester. The Advisory Committee must be formed (applies to all MES students) and a form submitted to the Graduate Program Assistant **no later than the tenth week of the student's second semester.**

Although the summer semester is the most common time for students to begin a project, students can commence a project at any time during their MES studies. Students are therefore encouraged to contact faculty members in an area of interest as early as possible in the program to discuss potential projects.

The relationship between the graduate student and the Advisor and the rights and responsibilities of the student and the Advisor are defined in more detail in the [Graduate Calendar](#). To help with this relationship, a list of expectations for both parties is given in Appendix A (section 8). Students and advisors are asked to read, discuss and sign this document at the start of the graduate student's program.

5.2.3 Duration of program and funding

The MES program can be completed in 12 months or be fast-tracked to 8 months if the course-only option is selected or if the activities for the research project (if applicable) are initiated early in the program (Fall or Winter semester). The program may take up to 3 years if registered as a part-time student. Students who are not able to complete the program within the allotted duration will need to submit a plan of study to graduate studies as per <http://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-maxreg.shtml>.

Students in the MES program will normally be self-funded, or funded by their employer, and will not receive any stipends from the SES or their advisor. They may, however, apply for teaching assistantships (see below) and to some internal awards.

5.2.4 Research project

Students in the MES program who select the research project option will complete it at the University or as part of a placement with an approved non-academic agency under the guidance of an SES faculty advisor or co-advisor. The student will have a co-advisor, who is part of the graduate faculty in SES, when completing a project outside of the University or outside of the School of Environmental Sciences.

Although the summer semester is the most common time for students to begin a project, students can commence a project at any time during the MES program. Students are therefore encouraged to contact faculty members in an area of interest as early as possible in the program to discuss potential projects.

The project may include analysis of a data set (derived from lab, field, or computer simulation), or major, critical literature review. The data may come from a pre-existing source or from measurements performed by the student.

The final research project report (see appendix/section 9 for preparation guidelines) must be submitted to the student's Advisory Committee at least four weeks prior to the end of the semester of submission. The student's Advisory Committee members will each evaluate the paper on a numeric grade basis, which will be averaged to give a final grade for the report. If the paper is deemed unsatisfactory, the student will be given an opportunity to make corrections and re-submit it. A second unsatisfactory result constitutes a recommendation to the Board of Graduate Studies that the student be required to withdraw (see Unsatisfactory Progress and Appeals of Decisions on the Graduate Calendar).

The student will make a presentation to the SES on their research project in the winter (8 month or part time option) or summer (12 month or part time option) semester prior to graduation. The presentation will follow standard conference oral presentation format with 15 minutes summarizing the research findings and 5 minutes for questions. These presentations will be scheduled through the Associate Director, Graduate Studies for SES and the Graduate Program Assistant in consultation with the students. The presentation will be graded by the Advisor and one other faculty, and these marks will be averaged to provide a grade for the presentation.

The marking scheme for the research project course will be determined and specified in a learning contract between the student and the advisor at the start of the project. It will include a combination of the following: draft and final of research project report, presentation, submission of datasets if doing original field or lab research, annotated bibliography if doing literature review.

5.2.5 After completion

The student is offered an opportunity to place his/her report on-line for wide public access. This is not mandatory but allows student reports to be available online for others to see and

provides a permanent link that can be used in electronic resumes or e-portfolios. Once the student has received a final grade for their research project report, they will be contacted by the Atrium Online Repository staff with instructions on how to submit their report. The process will include selecting appropriate creative commons and distribution licenses.

For more information, consult this link for details on how to submit to the Atrium:

<http://atrium.lib.uoguelph.ca/howToSubmissions.shtml>.

5.3 MSc program

5.3.1 Prescribed program of study and required courses

Students in the MSc program must complete 1.5 credits at the 6000 level. The SES requires all students to complete the seminar course ENVS 6900 as part of the 1.5 credits

To determine which courses the MSc should take to complete the credit requirements, the Advisory Committee shall meet with the student to discuss the student's background, interest, and knowledge in the proposed research area. The Advisory Committee will then establish a program of prescribed courses and additional courses (if any). The program of courses must be submitted to the Graduate Program Assistant **no later than the end of the tenth week of the student's second semester.**

5.3.2 Advisory Committee

The relationship between the graduate student and the Advisor and the rights and responsibilities of the student are defined in more detail in the Graduate Calendar. To help with this relationship, a list of expectations for both parties is given in Appendix A (section 8). Students and advisors are asked to read, discuss and sign this document at the start of the graduate student's program.

The Advisor is responsible for forming the Advisory Committee in consultation with the student. The Committee for MSc students shall consist of the Advisor or Co-Advisors (who usually serves as Chair of the Committee) and at least one additional member of the Graduate Faculty, Associate Graduate Faculty, or Special Graduate Faculty. The majority of MSc Advisory Committees have three members. Suitably qualified individuals who are not members of the Graduate Faculty at the University of Guelph may be appointed to an Advisory Committee after being appointed as Associated or Special Graduate Faculty. Appointments to Associate or Special Graduate Faculty are made by the Board of Graduate Studies on recommendation by the Director of the SES. Information pertaining to the difference between Graduate, Associate and Special Graduate faculty are available at

<https://www.uoguelph.ca/graduatestudies/gchandbook/grfacultyappts>. Preferably, the Advisory Committee should be established and should meet before the end of the student's

first semester. The Advisory Committee must be formed and submitted to the Graduate Program Assistant **no later than the tenth week of the student's second semester.**

5.3.3 Duration of program and funding

The expected completion time for a MSc by thesis program is 6 semesters. Students who do not complete their program within the prescribed completion period will be notified, and both the student and the advisory committee will be asked to submit a single plan of study for completion by the time of the maximum program duration (please see details at <http://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-maxreg.shtml>).

The minimum guaranteed stipend for students in the MSc by thesis program is \$16,500¹ (graduate research assistantship, GRA) and the duration of support is 6 semesters (referred to as “eligible semesters” below). Students may apply for additional support in the form of scholarship, awards or other assistantships. Assistantships may be graduate teaching assistantships (GTA) or graduate service assistantships (GSA) as discussed below. Masters NSERC holders will receive an additional \$7,500 per year, \$5,000 from the University and \$2,500 from the Advisor while holding the NSERC scholarship. MSc students whose NSERC funding has expired but who are still within the eligible semester period will receive the base funding of \$16,500. International students will receive the respective base funding plus an additional \$3,000 per year to help offset the higher fees incurred by these students.

Part-time MSc students may or may not be supported by their research supervisor. Such support is at the discretion of the advisor and is not required by the University or the School.

Please note that because student support usually comes from their Advisor's research grants, there will be certain expectations regarding reporting and publication of research results in a timely manner. Appendix A has additional details on the expectations and roles of students and advisors in the publications resulting from the graduate student program.

5.3.4 Thesis proposal and seminar

MSc students typically present both an oral and written proposal on their thesis research in the ENV5 6900 course. This proposal will outline the background, hypotheses, methods, and other pertinent aspects of the research project, and must be approved by the Advisory Committee. The public seminar will be scheduled in association with the seminar presentations for ENV5 6900 at the discretion of the faculty member(s) responsible for the course.

¹ All references to currency in this document are to Canadian Dollars

5.3.5 Evaluation reports

The Advisory Committee should meet with the MSc student at least once per semester to review course work and research progress. The Advisor will record an evaluation of the student's progress in the Evaluation Report form supplied each semester by the Office of Graduate Studies (usually distributed by the Graduate Program Assistant). The contents of the Evaluation Report will be made known to the student who then has the opportunity to add comments. A copy of all Evaluation Reports will be retained in the records of the SES. For students receiving a “some concerns” or “unsatisfactory” evaluation, a copy of the Evaluation Report will be retained in their files within the Office of Graduate Studies.

5.3.6 Final Examination

The final oral examination, devoted chiefly to the defense of the thesis, is a departmental examination identified as the MSc examination, where The student will present and defend his/her thesis. At this time, the thesis results are defended in a process that includes a presentation of the work and defense of the thesis results through oral questioning. Both are open to the public. The Graduate Calendar describes the nature of the various graduate examinations and the composition of the Examination Committee. Detailed procedures for initiating and completing the MSc examination within the SES are provided in Appendix A

The Candidate must read the Office of Graduate Studies, Thesis Submission Procedures and make sure they are ready to proceed. Students are strongly advised to attend one or more defenses to become familiar with the process.

The Candidate should download a copy of the School of Environmental Sciences Graduate Exam Information Form and Examination Request Form. This form must be signed by all members of the Advisory Committee indicating that the thesis is ready for defense before any formal actions relating to the defense are initiated. Questions about the process can be directed to the Graduate Program Assistant or the Associate Director (Graduate Studies).

5.3.6.1 MSc thesis Examination Committee

The MSc examination committee normally consists of three or four members appointed by the Associate Director (Graduate Studies), as follows:

1. A member of the Graduate Faculty who is not a member of the Advisory Committee is appointed to act as Chair of the Examination by the Graduate Program Committee by the authority of the Director of SES on behalf of the Dean (typically a faculty member of the School of Environmental Sciences). The chair will ensure that the thesis defense is conducted correctly and that the student is treated fairly;

2. A member of the Candidate's Advisory Committee (normally, the Advisor);
3. A member of the graduate faculty or the associate graduate faculty or special graduate faculty who may be a member of the Advisory Committee;
4. A fourth member may be appointed from among graduate faculty from another Department, from SES, but not from the Advisory Committee (the "internal external").

In normal practice, the Advisor(s) contact(s) these individuals in advance to determine their willingness and availability to serve on the Examination Committee, including reading and commenting on the thesis, and participating in the thesis defense on several possible defense dates.

5.3.6.2 Preparation for the defense

An Examination Information Form should be submitted to the Graduate Program Assistant and the Associate Director (Graduate Studies). After reviewing the nominations for Committee membership and potential dates for the examination on the Examination Information Form, the Associate Director (Graduate Studies) selects the Chair of the Examination Committee who then communicates with the Candidate and his/her Advisor(s) to verify the membership of the Examination Committee. Any concerns are addressed at this time by the Graduate Program Committee and, if required, the Director of the School and/or the Dean of Graduate Studies.

The Candidate and the Advisor(s) complete the Examination Request Form, and ensure that all the members of the Advisory Committee have signed the Examination Request Form to initiate subsequent steps in the defense process. A defense will not proceed without all members of the Advisory Committee signing the Examination Request Form. An individual's signature indicates that he/she believes the thesis is ready to be sent to the other members of the Examination Committee for review. It is not necessary that all signatures be on the same copy of the form, and signatures can be received by FAX. (The original signed forms are to be provided to the Chair of the Examination Committee at a later date). If delays are experienced, the Candidate and Advisor(s) work together to ensure the availability of all members of the Examination Committee for the revised defense date.

When the Chair of the Examination Committee receives the Examination Request Form(s) with signatures of all members of the Advisory Committee, the Chair examines the thesis to verify its suitability for defense. If it reads well, has appropriate introductory and concluding sections, and requires only minor corrections, then it is ready for defense. If the Chair decides it requires additional editing prior to defense, the thesis may be returned to the Candidate with specific instruction as to what is required. However, it is not necessary that the thesis be in its final form at this stage.

When the Chair of the Examination Committee has determined that the thesis is ready for defense, the examination copy of the thesis is prepared.

For both electronic and printed versions of the thesis, the copy of the thesis for examination should include continuous line numbering and be saved as an Adobe PDF file. Students should send electronic and printed (the latter if requested) copies of the thesis to the Examination Committee members (note, however, that a hard copy is easier to work from during the examination and the Candidate should have a hard copy at the defense). At this time, the Examination Request Form(s) is sent to Office of Graduate Studies, with a copy to the Graduate Program Assistant. Office of Graduate Studies requires approximately one week to prepare the paperwork for the defense.

A notice advertising the defense is prepared by the Graduate Program Assistant and is posted in several prominent locations within the School at least one week in advance of the thesis defense. This notice is distributed to the members of the Examination Committee, and other departments that may be interested in informing members of their department/unit of the defense.

The MSc Candidate is responsible for preparing the room for the defense (e.g., checking the functioning of the computer and projector, drinking water, and any other materials required).

5.3.6.3 The MSc thesis defense

The thesis seminar and final oral examination are open to the public. During the thesis defense, the order of activities is:

1. The Chair introduces himself/herself and welcomes everyone to the defense.
2. The Chair introduces all members of the Examination Committee and their contributions. The Chair may also introduce members of the Advisory Committee who are not represented on the Examination Committee.
3. The Chair outlines the procedure to be followed during the examination.
4. The Candidate presents a comprehensive 30-40 min seminar on the thesis research.
5. The Chair of the Examination Committee invites questions from all except the Examination Committee. After these questions, there will be a short break, during which members of the public may leave.
6. Each member of the Examination Committee asks questions of the Candidate for 15-20 minutes in the first round, followed by 5-10 minutes in the second round of questions, including, if desired, the Chair of the Examination Committee. Questions should relate primarily to the thesis but the MSc examination is also considered to be a general examination on related topics so questions related, to but outside of, the thesis are permitted. The Chair of the Examination Committee keeps notes on the performance of the Candidate and can interrupt as needed to ensure the fairness of the examination. Any examiner may interject a related question at the discretion of the Chair of the Examination Committee.

7. Following the completion of the normal rounds of questioning, any final supplemental questions may be asked.
8. The candidate and all visitors are requested to leave while the Examination Committee deliberates the results of the examination. The Chair solicits independent feedback from each member concerning the defense and other relevant matters. The Candidate is deemed to have passed the examination if no more than one member of the Examination Committee votes negatively or abstains from voting. Forms requiring signatures are circulated. The Examination Committee will then determine what revisions and corrections, if any, are required and who will be responsible for overseeing their completion by the student. It is common, for example, for the Chair of the Examination Committee to withhold his/her signature from the examination forms pending evidence of satisfactory completion of the requested revisions.
9. The Candidate is recalled and immediately informed of the decision and of recommended and required revisions to the thesis. The Chair of the Examination Committee provides verbal comments to the Candidate concerning his/her thesis and its defense. If the outcome of the defense is “unsatisfactory,” clear indications of the deficiencies must be provided to the Candidate, both verbally and later in writing (within three working days), and the Candidate and Examination Committee discuss the next steps to be taken and potential dates for a second defense. (No more than two final oral examinations of the thesis are allowed).
10. The Advisor of the Candidate and the Chair of the Examination Committee will ensure that all required revisions are completed and the examination forms submitted.

5.3.6.4 After the defense

There are a number of tasks that need to be completed after the defense. At the conclusion of the defense, the Chair of the exam provides verbal comments to the Candidate concerning his/her thesis and its defense, and the student will be given a number of forms that need to be completed and handed in with the final copy of the thesis.

Most theses require some corrections and edits after the defense and it is normal for one of the examiners to withhold their signature of approval until these corrections are addressed. All corrections from all examiners must be specifically addressed. Where the student is unsure of the meaning of the comment, they should consult with the examiner and/or Advisor(s). When all corrections are made, the student should discuss what they have done with their Advisor(s) and the examiner whose signature was withheld. When this process is completed, and the examination approval form is fully signed, the thesis is ready for submission.

Office of Graduate Studies (GPS) has specific requirements for the format of the thesis and an electronic submission process which is explained at this link:

<https://www.uoguelph.ca/graduatestudies/thesis/index>.

Upon final approval of your thesis in Office of Graduate Studies, an email will be sent to the student.

Before leaving SES the student is required to comply with SES regulations regarding safe disposal of samples, removal of personal belongings from laboratory, desk and office space, and return of all keys for return of deposit (if applicable).

5.4 PhD program

5.4.1 Prescribed program of study and required courses

The SES requires all PhD students to complete the seminar course ENVS 6900. Students who completed ENVS 6900 (or equivalent as approved by the Associate Director, Graduate Studies) during their MSc degree are not required to take it again as PhD students within SES.

There are no set credit requirements for the PhD degree except for the seminar course listed above. However, the Advisory Committee shall meet with the student to discuss the student's background, interest, and knowledge in the proposed research area. The Advisory Committee will then establish a program of prescribed courses and additional courses (if any). The program of courses must be submitted to the Graduate Program Assistant **no later than the end of the tenth week of the student's second semester.**

5.4.2 Advisory Committee

The relationship between the graduate student and the Advisor and the rights and responsibilities of the student and the Advisor are defined in more detail in the [Graduate Calendar](#). To help with this relationship, a list of expectations for both parties is given in Appendix A (section 8). Students and advisors are asked to read, discuss and sign this document at the start of the graduate student's program.

The Advisor is responsible for forming the Advisory Committee in consultation with the student. The Committee for MSc students shall consist of the Advisor or Co-Advisors (who usually serves as Chair of the Committee) and at least one additional member of the Graduate Faculty, Associate Graduate Faculty, or Special Graduate Faculty. The majority of MSc Advisory Committees have three members. The Committee for PhD students shall consist of the Advisor or Co-Advisors (who usually serves as Chair of the Committee) and at least two other members of the Graduate Faculty, Associate Graduate Faculty, or Special Graduate Faculty, one of whom must be a member of a Department or School at the University of Guelph other than SES. The

majority of PhD Advisory Committees have four members. Suitably qualified individuals who are not members of the Graduate Faculty at the University of Guelph may be appointed to an Advisory Committee after being appointed as Associated or Special Graduate Faculty. Appointments to Associate or Special Graduate Faculty are made by the Board of Graduate Studies on recommendation by the Director of the SES. Information pertaining to the difference between Graduate, Associate and Special Graduate faculty are available at <https://www.uoguelph.ca/graduatestudies/gchandbook/grfacultyappts>. The Advisory Committee must be formed and submitted to the Graduate Program Assistant **no later than the tenth week of the student's second semester.**

5.4.3 Duration of program and funding

The expected completion time for a PhD program is normally 9 semesters, or 12 semesters for students who transferred up from the MSc program, referred to as “eligible semesters” below. Financial support is guaranteed in the form of scholarships or assistantships for all eligible semesters.

Students who do not complete their program within the prescribed completion period will be notified, and both the student and the advisory committee will be asked to submit a single plan of study for completion by the time of the maximum program duration (please see details at <http://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-maxreg.shtml>).

Domestic PhD students will be guaranteed a minimum stipend of \$17,500 (Graduate Research Assistanship, GRA) plus an additional \$3,000 SES Scholarship and a ½ Graduate Teaching Assistantship (GTA) per year, while within eligible program semesters. Doctoral NSERC holders will receive an additional \$10,000 per year, \$5,000 from the University and \$5,000 from the Advisor while holding an NSERC scholarship. Doctoral students whose NSERC funding has expired but who are still within the eligible semester period will receive the same level of funding described above for non-scholar domestic PhD students. International students will receive the respective base funding plus an additional \$3,000 per year to help offset the higher fees incurred by these students.

Part-time MSc students may or may not be supported by their research supervisor. Such support is at the discretion of the advisor and is not required by the University or the School.

Please note that because student support usually comes from their Advisor's research grants, there will be certain expectations regarding reporting and publication of research results in a timely manner. Appendix A has additional details on the expectations and roles of students and advisors in the publications resulting from the graduate student program.

5.4.4 Evaluation reports

The Advisory Committee should meet with the PhD student at least once per semester to research progress. The Advisor will record an evaluation of the student's progress in the Evaluation Report form supplied each semester by the Office of Graduate Studies (usually distributed by the Graduate Program Assistant). The contents of the Evaluation Report will be made known to the student who then has the opportunity to add comments. A copy of all Evaluation Reports will be retained in the records of the SES. For students receiving a “some concerns” or “unsatisfactory” evaluation, a copy of the Evaluation Report will be retained in their files within the Office of Graduate Studies.

5.4.5 Thesis proposal and seminar

PhD students typically present both an oral and written proposal on their thesis research in the ENVS 6900 course. PhD students who have completed this course during their MSc studies or who switched from their MSc to the PhD program without completing the MSc degree in the school are not required to take this course again. However, they are required to prepare a written proposal and present a public seminar on their proposed doctoral thesis research before the end of their second semester in the PhD program. This proposal will outline the background, hypotheses, methods, and other pertinent aspects of the research project, and must be approved by the Advisory Committee. The public seminar will be scheduled through the Graduate Program Assistant in consultation with the student and the Advisor (this presentation may take place in association with the seminar presentations for ENVS 6900 at the discretion of the faculty member(s) responsible for the course).

5.4.6 Qualifying Examination

The Qualifying Examination, administered by the School's Graduate Program Committee, is a component of the doctoral program at the University of Guelph. Students must successfully complete this examination as part of their graduation requirements. The objective of these guidelines is to provide School-specific information for both students and faculty regarding the Qualifying Examination, with the goal of administering the Qualifying Examination as simply as possible.

The Qualifying Examination provides an opportunity to ensure that students have acquired an in-depth understanding of their area of research and in the broader aspects of scientific research and knowledge. For faculty, the Qualifying Examination provides an opportunity to assess the student's breadth and depth of understanding of the subject area and related fields, technical competence, analytical skills, capacity for critical thinking and to identify a student's weaknesses that can be addressed within our graduate program. As the name implies, upon successful completion of the Qualifying Examination, a student qualifies for the status of PhD Candidate. Thus, the Qualifying Examination allows the School to determine if a student is ready to progress to the dissertation stage of the doctoral degree.

Preparation for the Qualifying Examination involves a period of study and preparation (typically 2-3 months). There are numerous strategies that students can use to cope with the challenge of taking the Qualifying Examination; some of these are outlined in the accompanying Qualifying Primer document prepared by students who have previously completed the examination ([PhD Qualifying Primer](#)).

According to University regulations, PhD students should complete the Qualifying Examination before the end of the 5th semester of study. The SES suggests that this examination be completed even earlier, preferably at the beginning of the 5th semester, so that, in the event a second examination is needed, it can be completed before the end of the 5th semester. For students who are switching from MSc to the PhD program without completing the MSc, the University stipulates that the Qualifying Examination must be completed before the end of the 7th semester, while the School suggests that this examination be completed by the end of the 6th semester. Detailed procedures for initiating and completing the PhD Qualifying examination within SES are provided in Appendix D.

5.4.7 Final Examination

In the final examination, the thesis results are defended in a process that includes a presentation of the work and defense of the thesis results through oral questioning. Both are open to the public. The Graduate Calendar describes the nature of the various graduate examinations and the composition of the Examination Committee. Detailed procedures for initiating and completing the PhD examination within the SES are provided in Appendix B.

The Candidate must read the [Office of Graduate Studies, Thesis Submission Procedures](#) and make sure they are ready to proceed.

The Candidate should download a copy of the [Examination Request Form](#). This form must be signed by all members of the Advisory Committee indicating that the thesis is ready for defense before any formal actions relating to the defense are initiated. Questions about the process can be directed to the Graduate Program Assistant or the Associate Director (Graduate Studies).

5.4.7.1 Thesis Examination Committee

The PhD thesis Examination Committee consists of five people with no more than two members of the Examination Committee from the Advisory Committee. Members are selected by the Advisory Committee and are as follows:

1. A member of the Graduate Faculty who is not a member of the Advisory Committee is appointed to act as Chair of the Examination by the Associate Director (Graduate Studies) by the authority of the Director of SES on behalf of the Dean (typically a faculty

member of the School of Environmental Sciences). The chair will ensure that the thesis defense is conducted correctly and that the student is treated fairly;

2. A member of the Candidate's Advisory Committee (normally, the Advisor);
3. A member of the graduate faculty, the associated graduate faculty, or special graduate faculty who may be a member of the Advisory Committee;
4. A fourth member from among graduate faculty normally from another Department or School at the University of Guelph (the "internal external").
5. A fifth member who has a doctoral degree, is an expert in the area, and is from outside the University, is the external examiner. The external examiner is selected by the Associate Director (Graduate Studies) from a list of two or more nominees provided by the Advisory Committee. To facilitate this, CVs may be requested by the Associate Director (Graduate Studies). The external must be free of conflict of interest and may not have worked with or published with the Candidate or the Advisor(s) within the previous five years, not be adjunct, associate or special faculty in any Department or School at Guelph, must not be a previous student or supervisor of the Advisor(s), and must declare that they are free of any conflict of interest.

In normal practice, the Advisor(s) contact(s) these individuals in advance to determine their willingness and availability to serve on the Examination Committee, including reading and commenting on the thesis and participating in the thesis defense on several possible defense dates. This preliminary informal contact should not be confused with the formal invitation to serve on the Committee that comes from the Associate Director (Graduate Studies) after deciding on which of the nominees to formally invite to serve.

5.4.7.2 Preparation for the defense

An Examination Information Form should be submitted to the Graduate Program Assistant and the Associate Director (Graduate Studies). After reviewing the nominations for the Examination Committee and the External Examiner, the Associate Director (Graduate Studies) will contact the External to ensure that they are available and free of conflict of interest. The Associate Director (Graduate Studies) will then appoint a Chair of the Examination Committee who will then communicate with the Candidate and his/her Advisor(s) to verify the membership of the Examination Committee. Any concerns are addressed at this time by the Associate Director (Graduate Studies) and, if required, the chair of the department and/or the Dean of Graduate Studies. At this point the Chair of the Examination Committee formally contacts the external examiner to invite them to serve and provides them with:

- A cover letter explaining details concerning the report the External Examiner is expected to prepare, expenses, hotel and travel arrangements, and time lines if these have been determined

- The Guidelines for the report of External Examiner for the PhD Thesis,
- A Statement of Taxable Status, and
- The External Examiner Expense Form

The Candidate and Advisor(s) then complete the Examination Request Form, and ensure that all the members of the Advisory Committee have signed the Examination Request Form to initiate subsequent steps in the process. An individual's signature indicates that he/she believes the thesis is ready to be sent to the other members of the Examination Committee for review. It is not necessary that all signatures be on the same copy of the form, and signatures can be received by FAX or e-mail (The original signed forms are to be provided to the Chair of the Examination Committee at a later date). If delays are experienced, the Candidate and Advisor(s) work together to ensure the availability of all members of the Examination Committee for the revised defense date.

When the Chair of the Examination Committee receives the Examination Request Form(s) with signatures of all members of the Advisory Committee, the Chair examines the thesis to verify its suitability for defense. If it reads well, has appropriate introductory and concluding sections, and requires only minor corrections, then it is ready for defense. If the Chair decides it requires additional, minor editing prior to defense, the thesis may be returned to the Candidate with specific instruction as to what is required. However, it is not necessary that the thesis be in its final form at this stage.

The approved thesis is sent to the External Examiner and the other members of the Examination Committee at least **four** weeks prior to the date of the defense. It is suggested that the examination copy of the thesis be printed with continuous line numbers (for easier feedback) in PDF format or printed copies (if requested by the Examination Committee). Note that the Candidate can have access to a thesis copy during the defense. At this time, the Examination Request Form(s) is sent to Office of Graduate Studies, with a copy to the Graduate Program Assistant.

One week prior to the defense, the report of the External Examiner will be sent to the Chair of the Examination who will share this with the Candidate and the Advisor.

A notice advertising the defense is prepared by the Graduate Program Assistant and is posted in several prominent locations within the School one week in advance of the thesis defense. This notice is distributed to all members of the Examination Committee, the School, and other departments that may be interested in informing members of their department/unit of the defense.

5.4.7.3 The PhD thesis defense

The thesis seminar and final oral examination are open to the public. During the thesis defense, the order of activities is:

1. The Chair introduces himself/herself and welcomes everyone to the defense.
2. The Chair introduces all members of the Examination Committee and their contributions and thanks the external for their contribution to the examination of the thesis.
3. The Chair outlines the procedure of the examination as outlined below.
4. The Candidate presents a comprehensive 40-50 minute seminar on the thesis research.
5. The Chair of the Examination Committee invites questions from all except the Examination Committee. After these questions, there will be short break, during which members of the public may leave.
6. Each member of the Examination Committee asks questions of the Candidate for 20 minutes in a first round, followed additional questioning for 5-10 minutes in a second round. Both rounds of questioning may include questions from the Chair of the Examination Committee. Questions should relate primarily to the thesis research. The Chair of the Examination Committee keeps notes on the performance of the Candidate and can interrupt as needed to ensure the fairness of the examination. Any examiner may interject a related question at the discretion of the Chair of the Examination Committee.
7. Upon completion of the questioning, the Candidate and all visitors are requested to leave while the Examination Committee deliberates the results of the examination.
8. The candidate and all visitors are requested to leave while the Examination Committee deliberates the results of the examination. The Chair solicits independent feedback from each member concerning the defense and other relevant matters. The Candidate is deemed to have passed the examination if no more than one member of the Examination Committee votes negatively or abstains from voting. Forms requiring signatures are circulated. The Examination Committee will then determine what revisions and corrections, if any, are required and who will be responsible for overseeing their completion by the student. It is common, for example, for the Chair of the Examination Committee to withhold his/her signature from the examination forms pending evidence of satisfactory completion of the requested revisions.
9. The Candidate is recalled and immediately informed of the decision and of recommended and required revisions to the thesis. The Chair of the Examination Committee provides verbal comments to the Candidate concerning his/her thesis and its defense. If the outcome of the defense is "unsatisfactory," clear indications of the deficiencies must be provided to the Candidate, both verbally and later in writing (within three working days), and the Candidate and Examination Committee discuss the next steps to be taken and potential dates for a second defense. (No more than two final oral examinations of the thesis are allowed).

10. The Advisor of the Candidate and the Chair of the Examination Committee will ensure that all required revisions are completed and the examination forms submitted.

5.4.7.4 After the defense

There are a number of tasks that need to be completed after the defense. At the conclusion of the defense, the Chair of the exam provides verbal comments to the Candidate concerning his/her thesis and its defense, and the student will be given a number of forms that need to be completed and handed in with the final copy of the thesis.

Most theses require some corrections and edits after the defense and it is normal for one of the examiners to withhold their signature of approval until these corrections are addressed. All corrections from all examiners must be specifically addressed. Where the student is unsure of the meaning of the comment, they should consult with the examiner and/or Advisor(s). When all corrections are made, the student should discuss what they have done with their Advisor(s) and the examiner whose signature was withheld. When this process is completed, and the examination approval form is fully signed, the thesis is ready for submission.

Office of Graduate Studies (GPS) has specific requirements for the format of the thesis and an electronic submission process which is explained at this link:

<https://www.uoguelph.ca/graduatestudies/thesis/index>.

Upon final approval of your thesis in Office of Graduate Studies, an email will be sent to the student.

Before leaving SES the student is required to comply with SES regulations regarding safe disposal of samples, removal of personal belongings from laboratory, desk and office space, and return of all keys for return of deposit (if applicable).

6. Funding sources for graduate students

Graduate students in the MSc and PhD program are provided funding in the form of scholarships or assistantships for a minimum duration that varies with the program (please see above). Students in the GDip and MES program do not receive funding support.

The SES Graduate Program Committee is responsible for coordinating applications for various internal and external scholarships and awards for SES students. For further details on GRAs, GTAs, GSAs and other awards see the Graduate Calendar.

The student award database can be searched at
<http://www.uoguelph.ca/registrar/studentfinance/index.cfm?app=gawards>

and a complete listing of available awards can be found in the graduate calendar:
<http://www.uoguelph.ca/registrar/calendars/graduate/current/gradawards/index.shtml>

6.1 Graduate Research Assistantship (GRA)

The duties and responsibilities of GRAs are defined in the Graduate Calendar. There is no arbitrary upper limit on the stipend a graduate student receives within the guidelines explained above for each program. The remuneration of Graduate Research Assistants is based on the Natural Sciences and Engineering Research Council concept of support of a graduate student through a research grant to his or her Advisor. The concept is supported by other granting agencies. The support provided under the category Graduate Research Assistantship (GRA) is not of the nature of payment for services rendered but is a stipend to students whose thesis research is being supported by the grant(s). The amount paid to a Graduate Research Assistant is determined by the provisions of the grant and the minimum values stipulated above for MSc or PhD and is approved by the SES Associate Director (Graduate Studies).

As the GRA is a stipend, the position is not formal employment and does not include the normal benefits as would be associated with regular employment. However, in SES, a GRA is entitled to ten (10) working days of vacation in each year. Advanced notice (5 working days) of intent to take vacation must be given to the Advisor(s) and the vacation time must be approved by the Advisor(s). Vacation time in excess of this amount, or in lieu of time devoted to the responsibilities of the GRA during statutory and University holidays, is at the discretion of the Advisor(s).

The Advisor is not obliged to provide any GRA support to those students holding a scholarship with a value greater than or equal to the minimum stipend of the School. For students holding a scholarship below the minimum department stipend, the faculty Advisor is required to contribute funds such that the combination of scholarship and GRA support is at least equivalent to the minimum GRA stipend. In the case of international students with a scholarship, 'minimum GRA stipend' is understood to include a \$3,000 supplement mentioned above.

In cases where full-time graduate students are to be supported by their employer, the employer must provide a letter stating that their support will be greater than or equal to the minimum Departmental GRA stipend. Again, in the case of international students, 'minimum GRA stipend' is understood to include the \$3,000 supplement. Where such a letter is given, the faculty Advisor is not obliged to provide any GRA support to these students.

Except under extraordinary circumstances, the School of Environmental Sciences does not accept 'self-funded' or 'unfunded' full-time graduate students in the research-based MSc or PhD programs. Applications seeking exception to this policy will be considered on a case by case basis.

6.2 Graduate Teaching Assistantship (GTA)

All graduate students are encouraged to acquire teaching experience. The duties and responsibilities of GTAs are defined in the Graduate Calendar. Students are encouraged to inform their Advisor(s) of their intentions to accept a GTA. A GTA appointment usually spans 14 weeks - 12 weeks of classes plus preparation and examination working time.

At the beginning of each semester a GTA has been awarded, the awardee will meet with the faculty/individual(s) responsible for the course/service(s) to complete an "Assignment of Work Agreement" form outlining the expected distribution of effort (www.uoguelph.ca/hr/file/1497/download/4760/pdf). The selection and appointment of GTAs will follow the procedures outlined in the agreement with CUPE 3913, Unit 1.

The salary of GTA's includes a 4% payment in lieu of vacation time. Other leaves of absence from GTA positions are described in the agreement with CUPE 3913, Unit 1.

6.3 Graduate Service Assistantship (GSA)

The duties and responsibilities of GSAs are defined in the [Graduate Calendar](#). Students should inform their Advisor(s) of their intentions to accept a GSA. A GSA may provide services to either a teaching or a research program. The typical GSA (research) would normally be involved in rendering service not directly related to the thesis research. The level of support provided through a GSA will depend on the nature of service provided.

At the beginning of each semester a GSA has been awarded, the awardee will meet with the faculty/individual(s) responsible for the course/service(s) to complete an "Assignment of Work Agreement" form outlining the expected distribution of effort (www.uoguelph.ca/hr/file/1497/download/4760/pdf).

The salary of GSA's includes a 4% payment in lieu of vacation time. Other leaves of absence from GSA positions are described in the agreement with CUPE 3913, Unit 1. The Advisor(s) should be informed when leave of absence is needed.

7. Safety and other SES Regulations

7.1 Safety

Students must abide by all use and safety regulations in SES. All students must be trained in WHIMIS and be aware of specific lab and field safety procedures through discussion and completion of the SES Safety Checklist with their advisors (see: [SES Workspace SafetyChecklist 20100507.pdf](#)).

See also relevant university guidelines for use of equipment and safety regulations (<https://www.uoguelph.ca/ehs/>).

All new students will also be required to attend the SES Safety Orientation Seminar.

Upon completion of their research, graduate students are responsible for clearing all samples, solutions, etc. that they have used during their research and leaving their work area in a clean state for incoming students. Any samples retained at the request of an Advisor, must be itemized, properly labeled, and stored under appropriate conditions under the Advisor's name. The student and Advisor must provide assurance that laboratory and office space is in order before the *Recommendation for Degree* form is signed by the Director. Graduate students must also make available to the Advisor(s) all final original research materials, retaining a copy where appropriate. This includes relevant electronic files, field and lab notes associated with the original research and preparation of the thesis.

7.2 Intellectual Property

Ownership of research data and intellectual property will be determined on the basis of a written agreement between the Advisor(s) and the student and will be dependent on the nature of the funding and any overriding agreements such as those associated with a research contract between the sponsor and the University (see guidelines in the graduate calendar). Office of Graduate Studies has guidance on [inventions](#), [protection of intellectual property](#), and [Student Rights and Responsibilities](#). Normally, intellectual property is owned by the discoverer and may be published by the discoverer. In cases where a student elects not to publish their data, the Advisors(s) or members of the Advisory Committee may publish the data. Ownership and authorship will be as agreed to in a specific written agreement signed by the student or as in the signed Advisor(s)-Graduate Student agreement (Appendix A) before the end of the first semester.

8. Appendix A: Expectations of the Graduate Student and Advisor

Graduate students and advisors are encouraged to keep an open dialogue and a collegial working environment. From time to time misinterpretation or lack of knowledge of rules and regulations can lead to confusion in the role of each person in this advisor-graduate student relationship. The following lists for students and their advisor or co-advisors is meant to help in the establishment of clear expectations and should be reviewed and signed by both parties at the start of a student's program.

8.1 Expectations of the graduate student

1. Grow intellectually, in part by fulfilling course requirements as outlined by the Advisory Committee, and to contribute to a field of knowledge by developing and carrying out a program of research.
2. Learn about and adhere to all appropriate deadline dates and regulations associated with registration, award applications and graduation requirements, as specified in the Graduate Calendar and/or the Office of Graduate Studies and/or the School of Environmental Sciences (SES).
3. Choose, with the approval of the Advisor(s) and Advisory Committee, a topic of research for which adequate resources are available, including financial and physical resources and faculty expertise.
4. Conform to University and Program requirements, academic standards, and guidelines including those related to deadlines, thesis or research project style, course requirements, intellectual property, academic misconduct and any relevant safety and/or workplace regulations. These are listed in the graduate calendar and the SES' policies and guidelines.
5. Produce a thesis or research project that is my own work and that meets the University and SES standards for style and quality, reflecting a capacity for independent scholarship in the discipline.
6. Recognize that the Advisor(s) and members of the Advisory Committee have other educational, research and service obligations that may preclude immediate responses to the graduate student.
7. Consider and respond to advice and constructive criticisms provided by the Advisor(s) or members of the Advisory Committee, as promptly as possible.

8. Meet or communicate regularly with the Advisor(s) (or designate). I understand that the frequency and timing of meetings will depend on the nature of the research being undertaken and the stage in my program. If I am in a thesis-based program, I also understand that I should interact with individual Advisory Committee members and other faculty as appropriate and meet with my full Advisory Committee, normally no less than once per semester, to review progress.
9. On a regular basis, make available to the Advisor(s) all original research materials, including digital files, retaining a copy where appropriate.
10. Be prepared to approach first the Advisor(s) and then the Director of the Graduate Program or Chair with any perceived problems or changes in circumstances that could affect performance.
11. Submit, in writing, with specific reasons, any request for the replacement of my Advisor(s) or member of my Advisory or Examining Committee to the Director of the Graduate Program should a personal or professional conflict arise. I understand that I should take immediate steps (normally starting with a meeting with the Director of the Graduate Program) to change my Advisor(s) or a member of my Advisory Committee in cases where an appropriate academic relationship cannot be maintained.
12. Recognize that changing Advisors after program entry may have consequences for me in terms of the nature and focus of an appropriate research topic, and may alter funding planned for a thesis-based program prior to the change from the initial Advisor as outlined in the School's letter of funding.
13. Recognize that I may be obliged to satisfy specific performance requirements that were agreed to at the time of acceptance to the graduate program. These performance requirements may relate to internal or external funding support that I receive.
14. Recognize that progress in a thesis-based program will be evaluated every semester by the Advisor(s) and Advisory Committee, and reported to the Program director. In the case of "some concerns" or "unsatisfactory" performance, the Advisor(s) or Graduate Program Assistant will submit a copy of the report to the Office of Graduate Studies.
15. Conform to the appropriate guidelines on vacation time; inform my Advisor(s) prior to taking vacation; and make all necessary arrangements for continuation of experiments and/or data collection when I am on vacation.
16. My expectations regarding authorship are as follows:
 - a. In cases where my intellectual contribution to the work was negligible, for example in the case of GSA service or routine laboratory work without an active role in experimental design, execution, or data analysis, I will be acknowledged in any publication but will not be shown as co-author.

- b. In cases where I made a substantive intellectual contribution to the work, but did not take the lead role in design, execution, or data analysis, I will be shown as a junior author on any publication.
- c. In cases where I had a major intellectual contribution to the work, and took the lead role in design, execution, and data analysis, I will be shown as the lead author on any publication.
- d. I will not submit a manuscript, abstract, or poster for consideration by a scholarly journal or meeting unless its content has been approved by all co-authors.
- e. I understand that other researchers, including my advisor will be co-author(s) of publications arising from my research depending on their intellectual and/or funding contribution, as per discussion with my advisor prior to publication submission.
- f. I agree that, if I do not communicate with the Advisor(s) in regard to publication(s) arising from my thesis for ≥ 1 year after the date of submission of the thesis, the ownership of data and the rights to publish revert to the Advisor(s) and the above guidelines may not apply.

8.2 Expectations of the Advisor or Co-Advisors

1. Facilitate the student's intellectual growth and contribution to a field of knowledge.
2. Guide the student, with the assistance of the Advisory Committee if program is thesis-based, in the development of a program of study.
3. Encourage the MSc and PhD students to participate in at least one scientific meeting and, if available, fund travel to this meeting.
4. Assist in the development and execution of a research program or project.
5. Be reasonably accessible to the student via telephone, electronic communication or in person for consultation and discussion of the student's academic progress and research problems. I suggest the following schedule of meetings (check all that apply):
 - Weekly meetings with laboratory group
 - Biweekly private meetings to be scheduled on a semester basis, normally on (give date/time and place): _____

- Regular email correspondence; I will make every attempt to respond to email within 24 h of receipt, provided I am on campus and/or have reliable access to email
 - Other: _____
6. Thoroughly examine written material submitted by the student and make constructive suggestions for improvement. I make a commitment to inform the student of the approximate time it will take for submitted written material to be returned with comments. Normally, comments should be returned to the student within two weeks. When I am unable to respond within two weeks, because of circumstances such as absences from campus or unusually heavy workload, I will advise the student of alternative arrangements and time lines.
 7. Advise the student as to the acceptability of the draft thesis or research project prior to submission to the Advisory Committee (thesis) or final submission (research project). If I believe the thesis or research project is not ready for submission or will not be ready within a particular time, I will so indicate with written reasons to the student.
 8. Assist the student in learning about all appropriate deadline dates and regulations associated with thesis review, examination and submission, as specified in the Graduate Calendar and/or by the Office of Graduate Studies and/or the School. In cooperation with the Chair of the examination committee or Director of the Graduate Program, I will help to organize qualifying and final examinations.
 9. Give ample notice of extended absences from campus such as research leaves, and make satisfactory arrangements for the advising of the student when the Advisor is on leave or on extended absence from the campus. Depending on the length of absence, it may be necessary to make arrangements for an interim Advisor. As of the date of this agreement, I anticipate the following major absences from campus:
 - None
 - Research leave scheduled for _____ to _____ (mo/yr to mo/yr)
 - Other: _____
 10. Make reasonable arrangements, within the norms appropriate to the discipline and the limits of the material and human resources of the University, so that the research resources necessary for execution of the research (thesis or research project) are available.
 11. Advise the student of regulations designed to provide him/her with a safe environment. These include relevant safety and/or workplace regulations as well as policies designed to protect individual rights and freedoms.

12. I will endeavor to alert the student to any personal risks that may be encountered in the course of the research and provide training, guidance and adequate equipment appropriate for the mitigation of those risks.
13. Chair the Advisory Committee for the student, including:
 - a. Holding regular Advisory Committee meetings with the student, normally no less than once per semester
 - b. Submitting evaluation reports every semester, in consultation with the Advisory Committee, to the SES Graduate Program Assistant.
 - c. Formulating a plan of action with the student and the Advisory Committee to address any problems that have been identified as a result of a semester progress review², and when a semester progress rating of “Some Concerns” or “Unsatisfactory Progress” has been assigned, providing written notification, including the signatures of all Advisory Committee members, to the Faculty of Graduate Studies.
14. In thesis-based programs, comply with any commitment of financial support made to the student as part of the offer of admission. In the event that expected financial support becomes unavailable, I will work with SES and the Office of Graduate Studies to ensure that commitments of financial support for the student are met.
15. Acknowledge, in accordance with University policies, the contributions of the student in presentations and in published material, for instance through joint authorship. My expectations regarding authorship are as follows:
 - a. In cases where the student’s intellectual contribution to the work is negligible, for example in the case of GSA service or routine laboratory work without an active role in experimental design, execution, or data analysis, the student will be acknowledged in any publication but will not be shown as co-author.
 - b. In cases where the student has made a substantive intellectual contribution to the work, but has not taken the lead role in design, execution, or data analysis, the student will be shown as a junior author on any publication.

² A “satisfactory” evaluation represents normal progress on coursework and research. A “some concerns” report is compatible with an expectation for successful completion of the program, but indicates some specific concerns regarding the student’s current performance and/or progress on coursework or research or both.

An “unsatisfactory” report is a clear indication of concern about the student’s ability to complete the program. Such concern may be based on poor performance in coursework or research or both. Unsatisfactory progress could include failure to meet agreed research milestones, including the timely preparation of a research proposal.

- c. In cases where the student has had a major intellectual contribution to the work, and has taken the lead role in design, execution, and data analysis, the student will be shown as the lead author on any publication.
- d. I will be co-author of publications arising from the research except in some special circumstances as agreed upon through discussion prior to submission.
- e. No manuscript, abstract, or poster will be submitted for consideration by a scholarly journal or meeting unless its content has been approved by all coauthors.
- f. If the student does not communicate with the Advisor(s) in regard to publication arising from the thesis for ≥ 1 year after the date of submission of the thesis, the ownership of data and the rights to publish revert to the Advisor(s) and the above guidelines do not apply.

16. Immediately disclose to the Director of the School any conflict of interest that arises with the student. Conflicts of interest will arise when there are sexual, romantic, or familial ties between the student and me, or when there are irreconcilable interpersonal conflicts. In such cases, I expect that I will withdraw from the role of Advisor. Conflicts of interest may also arise when I, or the student, have a financial interest in the outcome of a research project. In these cases, I will consult with the Director of SES to determine whether withdrawal is appropriate.

Name of student: _____

Signature: _____ Date: _____

Name of advisor and co-advisor (if applicable) : _____

Signature(s): _____ Date: _____

9. Appendix B: Preparation and format for graduate theses and research projects

One of the most rewarding and challenging aspects of the graduate program will be the preparation, completion, and defense of the student's graduate research thesis or project paper, which will summarize the results and interpretations of the student's research. This document is intended to provide students with some introductory suggestions and acceptable formats for successfully preparing the thesis or research project paper. General suggestions for thesis are given in the sections below, followed by specific instructions for the MES project report.

9.1 Preparation of the thesis

The thesis is a vehicle which permits more expansiveness of thought and writing, speculation, and extended literature reviews than is permitted in refereed scientific papers. It permits the student to write extensively on a theme or group of themes and to explore relationships and intricacies more thoroughly than is permitted in papers. It can act as a repository of useful information that might be unpublishable in another format. The contents of the thesis ought to form a cohesive whole in which there is a thesis statement (an appropriate thesis, hypothesis, or objectives; see **Graduate Thesis Proposal**), a literature review tied to the thesis statement, a description and analysis of the research, and a discussion which explores the relationship of the research results to the literature and the thesis statement. These sections should flow smoothly from one part to the next and be presented in a uniform style.

It is important that the student clearly identify what parts of the thesis represent new contributions from the author of the thesis, published work by the author of the thesis, and unpublished work by other members of the student's research group. For multi-authored papers/chapters, the specific contributions of the student must be identified. Although publications stemming from the thesis are likely to be co-authored with the Advisor and/or other members of the research group, the thesis is authored entirely by the student.

9.2 Formats for the thesis

There are various styles and formats used in graduate student theses. Two commonly-used and accepted thesis formats for SES are presented Table 1 and Table 2 and one or the other should be followed. To gain a wider appreciation and understanding of thesis styles and formats, students should review several recent theses from former graduate students in SES, other units within the University of Guelph, and other universities. If students wish to format their thesis differently from the approved formats, this may be done with the approval of the Advisory Committee and Associate Director (Graduate Studies), and with Office of Graduate Studies.

Whenever possible, students are strongly encouraged to publish the results of their research prior to the completion of their thesis. Under these circumstances, they will probably choose to use the Chapter Format outlined in Table 1. This will allow each chapter in the thesis to be presented in a manuscript format. However, the format of each chapter must be in a style that is consistent throughout the thesis. One disadvantage of this style is that significant repetition and/or redundancy can arise between the various research chapters. Where possible, avoid this redundancy in the thesis by restricting the introduction, materials and methods, etc., to the thesis/hypotheses or objectives of each Chapter, and by cross-referencing to common elements between Chapters. Please note that, except for formatting of the thesis, the text, Figures, and Tables of Chapters that are already published or accepted for publication should be the same as the published paper. Exceptions to this may occur if additional experiments or analyses have occurred since publication or if an examiner recommends additional analyses to be completed. Further, the reference style should be that used in the thesis (i.e., all references at the end of the thesis).

Thesis Style 1 (**Table 1**) is most appropriate for research that involves different studies around a common theme or a series of related hypotheses (e.g., laboratory and field studies). SES recommends that students use Thesis Style 1 for preparation of their thesis.

Table 1. Thesis Style 1: Chapter format based on published papers

Chapter	Title and Contents
	<p>Preface. If chapters of the thesis have been published, submitted, or prepared for submission, this would describe the papers. This includes the authors and the paper, the title of the paper (the Chapter title), the journal where the paper was published, submitted to, or is to be submitted), and with a description of what each of the authors contributed to the paper.</p> <p>Abstract (of entire thesis)</p> <p>Acknowledgements</p> <p>Table of contents, List of Tables, List of Figures, Abbreviations (as appropriate)</p>
1	<p>Introduction and Literature Review (may be combined or separate)</p> <p style="padding-left: 40px;">Statement of thesis objectives and hypotheses.</p>
2	<p>Research Chapter A</p>

Chapter	Title and Contents
	Abstract (optional)
	Introduction (applies to specific section)
	Materials and Methods
	Results (or Results and Discussion)
	Discussion (or Discussion and Conclusions)
	Conclusions
3	Research Chapter B
	Abstract (optional)
	Introduction (applies to specific section)
	Materials and Methods
	Results (or Results and Discussion)
	Discussion (or Discussion and Conclusions)
	Conclusions
4	Research Chapter C, D, E, F, etc
5	Discussion (applies to all Chapters in thesis and how the work, as a whole, has contributed to the advancement of knowledge in the area)
6	Conclusions (or Discussion and Conclusions - applies to all Chapters in thesis and is combined with the above).
7	Literature Cited (applies to all Chapters)
8	Appendices (optional)

Table 2. Thesis Style 2: Traditional thesis format

Chapter	Title and Contents
---------	--------------------

Chapter	Title and Contents
	Abstract (of entire thesis)
	Acknowledgements
	Table of contents, List of Tables, List of Figures, Abbreviations (as appropriate)
1	Introduction and Literature Review (may be combined or separate) Statement of thesis objectives and hypotheses
2	Materials and Methods
3	Results (or Results and Discussion)
4	Discussion
5	Conclusions (or Summary and Conclusions)
6	Literature Cited
7	Appendices (Optional)

9.3 Figures and Tables

Figures and Tables in the thesis should be of high quality and should be publishable without further modification. Tables (see example in Table 1, above) should follow regular Journal styles with no vertical lines between columns, should not be pasted in as images from other software, and should be in the same font as the thesis. Graphs should be prepared using a scientific graphics package such as SigmaPlot®, see example in **Figure 2**. Excel graphs are seldom of high enough quality for a thesis or a publication.

Where possible, Figures and Tables should be integrated into the text and should have a clear caption and appropriate footnotes to allow them to stand on their own without reference to the text.

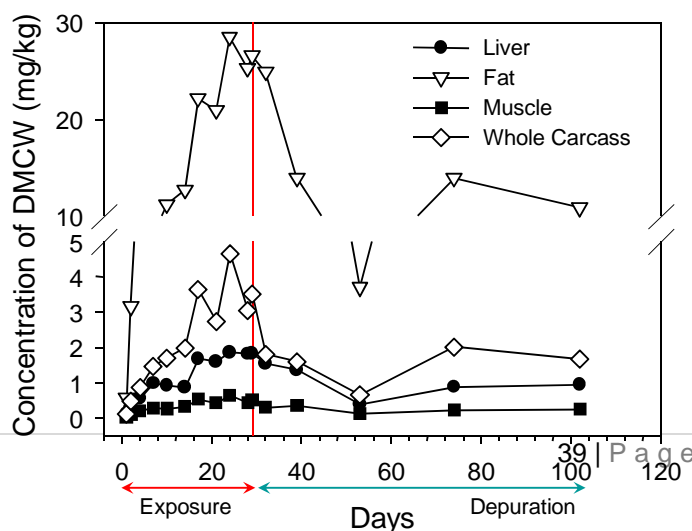


Figure 2. Example of graphic style using the golden rectangle (1 unit high, 1.61 units wide)

9.4 Additional comments and suggestions

The following comments are also offered as additional guidance to graduate students:

1. In the introduction, clearly state the thesis/hypothesis/objectives of the thesis. These objectives are an essential guide to material presented in the discussion.
2. The literature review should be included as part of the introduction or a stand-alone section/chapter of the thesis; do not allow the literature review to dominate the discussion section of the thesis.
3. Use journal-quality graphics. Choose a journal style that is appropriate.
4. Avoid duplication of data in graphic and tabular form. This sometimes is seen in the use of summary tables at the end of Chapters. Detailed presentation of data that support graphs and tables can be placed in appendices.
5. Graphical presentation can often be condensed into tabular format. This is true for some statistical data as well.
6. The conclusion should reflect the student's personal thoughts and ideas, and must address the hypotheses that were tested in the research.
7. The style should conform to good usage for scientific writing, i.e., it should meet the standard of scientific journals in the author's field. A number of style manuals are available, e.g., The Council of Biology Editors' Style Manual (AIBS), The European Life Science Editors' Manual (ELSE), Writing scientific papers in English³, or Fowler's Modern English Usage.
8. Particular attention should be paid to legend and captions of Figures, and to captions and column headings of Tables to ensure that, as far as possible, they are self-contained and self-explanatory and require minimal reference to the text on the part of the reader. For example, they could point out a specific feature in a photograph or an overall trend in the graph.
9. The intended message of the thesis should be evident not only to specialists in the field but to any environmental scientist of reasonably broad training. To this end, jargon should be kept to a minimum and unusual technical terms and acronyms should be defined. In theses that use a large number of acronyms, it is recommended that a glossary of acronyms be presented at the beginning or end of the thesis. Most importantly, the thesis should be in finished form when it reaches the members of the Candidate's Examination Committee. It should read well and should require little

³ See O'Connor, M. and Woodford, F.P. 1976. Writing scientific papers in English. Amsterdam: Elsevier (Bovey Building Reading Room) or Fowler's Modern English Usage (1984), Oxford University Press.

editing. Special attention should be directed at ensuring that all references to citations in the text match the “Literature Cited” section of the thesis. Several software programs (e.g., EndNote) that can help manage, insert, and format references into word processing software are available.

10. The thesis embodies the results of research. The cost of the research is normally borne by research funding of the Advisor, whereas the costs of preparing the thesis shall be borne by the student. For example, the Advisor is responsible for items such as research supplies, computer software, photographic supplies, etc. The student is responsible for costs associated with preparing and printing copies of the thesis for the examination and for final binding.

9.5 MES: Research project report

Students who chose the course + project option are expected to write a report about their project. Project formats may be varied and include analysis of existing data sets (derived from lab, field, or computer simulation), lab/field experiments conducted by the students, or a critical literature review. The length of the paper may vary, but it should be no more than 30 double-spaced pages including figures and tables. If based on existing or new data, the format should follow the standard format used in scientific journals for reporting original research (Abstract, Introduction, background, Materials and Methods, Results, Discussion, Conclusion, acknowledgments and works cited. If on the other hand, the project was a critical literature review, format should summarize and critically analyse the body of literature on a specific topic with works cited as is done in review papers from scientific journals. Data sets may be included in an appendix. Students should also follow the general and formatting suggestions outlined above in section 9.3 and 9.4.

10. Appendix C: MSc defense examination checklist

Week	Date Completed	Task	Responsibility
-10+		Check to make sure there is enough time to complete the process before the deadline for submission of the thesis without financial penalty.	Candidate and Advisor
- 9+		Read the document " <u>MSc Defense Process in the School of Environmental Sciences</u> " and make sure that the thesis conforms to the requirements.	Candidate
-9		Read the "Office of Graduate Studies, Thesis Submission Procedures" and make sure you are ready to proceed	Candidate
-8		Discuss appropriate people to serve on the Examination Committee with the Advisor and Advisory Committee.	Candidate
		Fill out <u>Examination Information Form</u> and send to Associate Director (Graduate Studies) for information and confirmation of selected Chair of the Examination and members of the Examination Committee.	Candidate and Advisor
-6		Confirm chair for the defense	Associate Director, Graduate Studies
-4		Provide signed Examination Request Form and copy of thesis to the Chair of the Examination.	Candidate

Week	Date Completed	Task	Responsibility
-3		Sign the Examination Request Form and send to the Graduate Program Assistant	Chair of Examination or Associate Director, Graduate Studies
		Arrange room for defense, print, and distribute notice of examination	Graduate Program Assistant
-2		Provide copies of thesis to all examiners	Candidate
-1 d		Pick up EXAMINATION PACKAGE (Certification of Approval and Recommendation for Graduation forms) from the Graduate Program Assistant.	Chair of Examination
0		Prepare room for defense; obtain projector and computer, and, if desired, appropriate libations.	Candidate or Advisor
0+		Submit the EXAMINATION PACKAGE forms to the Graduate Program Assistant after the examination (even if all signatures have not been obtained).	Chair of Examination

11. Appendix D: Guidelines for the PhD qualifying examination

11.1 Introduction

The Qualifying Examination, administered by the School's Graduate Program Committee, is a component of the doctoral program at the University of Guelph. Students must successfully complete this examination as part of their graduation requirements. The objective of these guidelines is to provide School-specific information for both students and faculty regarding the Qualifying Examination, with the goal of administering the Qualifying Examination as simply as possible. Need for a Qualifying Examination

The Qualifying Examination provides an opportunity to ensure that students have acquired an in-depth understanding of their area of research and in the broader aspects of scientific research and knowledge. For faculty, the Qualifying Examination provides an opportunity to assess the student's breadth and depth of understanding of the subject area and related fields, technical competence, analytical skills, capacity for critical thinking and to identify a student's weaknesses that can be addressed within our graduate program. As the name implies, upon successful completion of the Qualifying Examination, a student qualifies for the status of PhD Candidate. Thus, the Qualifying Examination allows the School to determine if a student is ready to progress to the dissertation stage of the doctoral degree.

Preparation for the Qualifying Examination involves a period of study and preparation (typically 2-3 months). There are numerous strategies that students can use to cope with the challenge of taking the Qualifying Examination; some of these are outlined in the accompanying Qualifying Primer document prepared by students who have previously completed the examination ([PhD Qualifying Primer](#)).

11.2 Timing of the Qualifying Examination

According to University regulations, PhD students should complete the Qualifying Examination before the end of the 5th semester of study. The guideline of the School requires that this examination be completed even earlier, preferably at the beginning of the 5th semester, so that, in the event a second examination is needed, it can be completed before the end of the 5th semester. For students who are switching from MSc to the PhD program without completing the MSc, the University stipulates that the Qualifying Examination must be completed before the end of the 7th semester, while the School suggests that this examination be completed by the end of the 6th semester.

11.3 Additional information about the Qualifying Examination

There are a number of people, and sources of information, that students may consult in preparation for their Qualifying Examination. The first contact should be the student's Advisor(s) and Advisory Committee. Together, the Advisor, Advisory Committee, and the student will decide on the appropriate time for this examination considering the time lines imposed by the University and the School. Students should also consult the general rules governing this examination which can be found in the University Graduate Calendar (General rules). The student should study these rules before proceeding to the Qualifying Examination with the help of his/her Advisory Committee and Graduate Program Committee. Students may also contact the Associate Director (Graduate Studies) regarding any administrative or technical questions pertaining to the Qualifying Examination. The Graduate Program Committee is responsible for coordinating and selecting a Chair for the examination.

11.4 Setting up the Qualifying Examination

The Qualifying Examination consists of two parts: written and oral.

The normal sequence of events for students to arrange their examination is:

- 1) The student meets with his/her Advisory Committee. The Committee considers the student's research ability and potential, as well as the background knowledge in the general and peripheral areas related to the student's doctoral research. The latter assessment may be done by performance in undergraduate and graduate courses taken by the student. If the Advisory Committee is satisfied with the student's potential as a PhD candidate based on his/her background knowledge and research ability, the Committee then recommends that the student proceed to the Qualifying Examination.
- 2) The Advisory Committee suggests the four subject areas to be examined and the examiners responsible for each of the topics in the Qualifying Examination. There are five members of the Qualifying Examination Committee. According to University regulations, two of these examiners must be University of Guelph graduate faculty who are not serving on the student's Advisory Committee, while the other two can be from the student's Advisory Committee. The 5th member chairs the examination. The Examination Chair may elect to assign an area of questioning ahead of the written exam and to ask general questions during the oral exam.
- 3) The Advisor approaches the Graduate Program Assistant, about setting up a Qualifying Examination with the following information:
 - a) Names and contact information of four potential examiners (maximum of two from the Advisory Committee and two other members). The examiners must be faculty members, associate faculty, or special faculty at the University of Guelph.
 - b) Two or 3 tentative dates for the oral examination.

- c) Names of potential Chairs. The Associate Director, (Graduate Studies) will chose the Chair of the Examination and may nominate people other than those suggested to chair the examination.
- d) The four subject areas for the examination.

This information will be forwarded to the Associate Director (Graduate Studies). This information is submitted on the Examination Information Form.

- 4) A Chair for the Examination is appointed by the Associate Director (Graduate Studies). The student will be notified once a chair has been chosen. The student should contact the Chair of the Qualifying Examination to get approval on the suggested Examination Committee before proceeding to the next step.
- 5) The student contacts each of the examiners to obtain guidance regarding the subject areas. After consultation with all members of the Examination Committee, a date/time is confirmed for the oral examination and a room is booked by the student or Graduate Program Assistant. The date/time information should be provided to the Graduate Program Assistant who will post the announcement at a suitable time before the examination.
- 6) At least two weeks before the scheduled written examination date, the Chair of the Examination Committee contacts and solicits questions from each of the examiners for the written examination. The written examination is usually completed about 1 to 2 weeks before the scheduled oral examination. The written examination may be completed over the course of one to four days and is administered by the Chair of the Examination Committee or a designate. The responses to the written questions may or may not serve as the basis for questioning in the oral examination.
- 7) The written examination will have the following general format:
 - a) The Chair of the Qualifying Examination will solicit two question(s) (possibly having several sub-questions) in writing from each of the four other examiners ≥ 2 weeks before the scheduled oral examination.
 - b) The Chair will select one question from each examiner to be presented to the student for written answers. Normally, the student will be given a 2-hour in-class time period to answer the question(s) from each examiner (i.e., a total of 8 h for all questions). The form of the written examination will be determined by the individual examiners. The Chair will examine the questions to minimize any overlap and consult with the examiners if necessary to ensure that the questions can be answered within this time frame. Each examiner will inform the Chair if his/her portion of the examination should be open or closed book and this should be noted on the question. For open book exams, the Chair, in consultation with the examiner, will communicate to the student what books or references can be used in the examination and if access to the internet is allowed. In closed-book exams, no texts, notes, or internet access is allowed. In both

closed and open book exams, additional aids or tools (such as calculators, specific references, and laptop computers) may also be granted. Prior to the examination, the student may discuss with individual examiners the format to be followed and the tools allowed, and the results of the discussion shall be conveyed by the examiner and the student to the Chair. The Chair and the examiner will have the final say on the ground rules for that examiner's question on the written examination. Once established, the student shall follow the rules set forth by the Chair. The examination is held over 1 - 4 days at the choice of the student. For example, one question is provided in the morning and one in the afternoon each day over two days. Except for the format and duration of the examination, other aspects of the examination are at the discretion of the Chair to accommodate special examination arrangements at the request of the student and/or individual examiner(s).

- c) After the examination, each examiner will receive the student's answers to all the questions and will then mark and/or evaluate his or her question(s). At least five working days prior to convening the oral examination, each examiner will inform the Chair if the student's answers to his/her questions are satisfactory. At this time, the Chair shall pass the decision of the examiners on to the student and the student may seek feedback from the examiners.
 - d) If the answers to written questions from two or more examiners receive an unsatisfactory assessment (a student receiving one unsatisfactory decision can still elect to proceed with the oral examination), the student will be advised but not required to repeat the written assignment for these examiners. In this case, the oral examination will be postponed and the student's graduate committee will decide on the appropriate course of action.
- 8) The oral examination will be held ≥ 2 weeks after the written examination is completed. Prior to the oral examination, the Advisor(s) will provide the Chair with a letter attesting to the student's research ability and potential. This letter should include the views of the student's Advisory Committee. This letter forms part of the assessment by the Examination Committee at the end of the oral examination. The oral examination will have the following general format:
- a) The Chair first invites the student to give a brief overview (5-10 min.) of his/her background, education and/or relevant experiences.
 - b) The Chair asks each member of the Examination Committee to pose questions to the student. The sequence of questioning by the examiners will be decided by the Chair.
 - c) There are normally two rounds (ca. 20 and 10 min, respectively, from each examiner) of questioning by the Examination Committee. Additional questions may be posed after these two rounds at the discretion of the Chair. When the questioning is completed, the student is asked to withdraw from the room to allow for private deliberations by the Examination Committee. The student is deemed to have passed the Qualifying

Examination if not more than one of the 5 examiners votes negatively. An abstention is regarded as a negative vote.

- d) After the deliberations, the Chair invites the student back to the room and conveys the findings of the Examination Committee to the student.

In the event of a disagreement between the student and the examiners as to how well a student has done in the Qualifying Examination, the matter will be referred to Office of Graduate Studies. Resolution of such disagreement may involve consultation with experts outside of the School at the discretion of the Office of Graduate Studies.

12. Appendix E: PhD defense examination checklist

Week	Date Completed	Task	Responsibility
-10+		<p>Check to make sure there is enough time to complete the process before the deadline for submission of the thesis without financial penalty. If so, candidate or Advisor submits the <u>School of Environmental Sciences Graduate Exam Information Form</u> to the Graduate Program Assistant.</p>	Candidate and Advisor
-8		<p>Discuss Examination Information Form with Candidate.</p> <p>Ensure that the thesis is close enough to finishing that proposed examination dates are reasonable. If so, then discuss with the Candidate appropriate people to serve on the Examination Committee, including potential External Examiners.</p> <p>Contact suggested Examination Committee members to determine their availability and select three potential dates for examination.</p> <p>Contact External Examiner(s) to determine willingness and availability; note that this is not an invitation, which must come from the Chair pending determination of suitability (see next box).</p> <p>Explain steps in the process to Candidate, identifying sources of information, and where to obtain necessary forms (e.g., (Graduate Studies and SES website).</p> <p>Submit completed Examination Information Form to the Associate Director (Graduate Studies).</p>	Advisor
-7		<p>Confirm availability of Chair of Examination and confirm</p>	Associate Director

Week	Date Completed	Task	Responsibility
		lack of Conflict of Interest and availability of the External.	(Graduate Studies)
-6		Officially invite the External Examiner to participate in the Examination. Send cover letter explaining details concerning the report the External Examiner is expected to prepare, expenses, hotel and travel arrangements, and time lines. Also include guidelines for the report of External Examiner, Statement of Taxable Status, and the External Examiner Expense Form. These can be found under Faculty Forms and Documents on the SES website.	Chair of Examination
-6		Check for signatures and Candidate or Advisor submits completed Examination Request Form and copy of defense thesis to the Examination Committee Chair.	Advisor
-5		<p>Examine the thesis and check for signatures of all committee members on the Examination Request Form. If thesis is acceptable for defense, sign the Examination Request Form.</p> <p>Give the signed Examination Request Form to the Graduate Program Assistant for submission to Office of Graduate Studies.</p> <p>Explain to Candidate details of the defense process (length of thesis presentation, question format in the defense, etc.).</p>	Chair of Examination
-4		Send PDF and/or hard copy of thesis and information to the External Examiner.	Graduate Program Assistant
-3		Arrange room for defense, print, and distribute notice of examination	Graduate Program

Week	Date Completed	Task	Responsibility
			Assistant
-1		Receive the Report on the Thesis from the External and distribute to the Advisor and Candidate	Chair of Examination
-1 d		Pick up EXAMINATION PACKAGE (Report of PhD Examination, Certification of Approval and Recommendation for Graduation forms) from the Graduate Program Assistant.	Chair of Examination
0		Prepare room for defense, obtain projector and computer, and appropriate libations.	Candidate
0+		<p>Submit the EXAMINATION PACKAGE forms to the Graduate Program Assistant after the examination (even if all signatures have not been obtained).</p> <p>Obtain Statement of Taxable Status form, External Examiner Expense Form and expense receipts from External and give to the Graduate Program Assistant.</p>	Chair of Examination