

COPE lab Graduate Student Expectations & Information

Karen E Kohfeld

Welcome to the COPE lab! This description of expectations is intended to ensure that we have a clear understanding of what we expect from one another, and to provide resources that may help in career planning. I am in a University position because I enjoy teaching people how to do science by engaging in real research projects with them, and helping them to develop a professional approach to scientific research.

Many students begin their work with a thesis advisor without a clear idea of what to expect, and without a clear idea of what it takes to succeed in a graduate program. This document is intended to provide a clear framework for our professional interaction. Read this and discuss any questions, issues, or suggested changes.

Remember that our professional relationship is a two-way interaction, and you should inform me of your hopes and goals in undertaking a project as well. Reading this should make you feel that you are embarking upon a challenging experience. It should not make you feel that I am unreasonable and rigid, and should not make you feel that this challenge will be a miserable experience!

Goals

Your reasons for entering our graduate program might include a desire to enter employment in private industry, discovering whether you like research enough to pursue a career in academia or government, or farther-afield pursuits such as gaining natural science experience as a basis for a law degree, etc. Regardless of your exact reason(s), your major goal should be learning how to be a professional scientist, and my major role as a mentor is to help you learn how to develop into a professional scientist.

I will provide advice and direction on your research project, including direction in choosing and designing a research topic, researching the background information, planning and conducting field, laboratory, and/or data analysis, writing and revising proposals, abstracts, and publishable manuscripts, and giving professional presentations. *I select and design (and/or guide you in selecting/designing) research projects with the intent that the results will be sufficiently new and important to merit publication*, and I have selected you as a student because of your talents and promise. Seeing a project through to publication requires *enormous* commitment and self-discipline, and will typically require significant work extending beyond the formal duration of your appointment. I will freely provide help, advice and suggestions, but you have the ultimate responsibility for completing your thesis satisfactorily.

I expect to write letters of recommendation for you, upon your request. I will want to write as positive and honest a letter as possible, so keep me aware of your successes, and help me to find good things to say about you! Let me help you fix areas in which you are not successful, and develop a professional attitude that keeps any insecurities in their proper place. You can trust me to write a letter of recommendation for you that describes your skills and ability as positively and honestly as possible. If you want me to write that you consistently do more than I expect, then make that effort; i.e., impress me.

Time Commitments and Project Milestones

The time commitment to research is an absolutely key issue for graduate students and mentors. **I expect you to construct and share with me a project timeline with specific goals each semester, and to meet these deadlines.** I will attempt to bolster your progress and your written and oral skills by requiring regular presentations of your work in lab meetings, a thesis proposal, and periodic meetings. You should let me know if problems arise in the course of meeting deadlines and expectations, such that we can find a mutually acceptable solution. Just as I am imposing demands on your time, you have a right to my time as well, in terms of mentoring you in your project progress. Accordingly, we will have periodic meetings to review progress and discuss any issues or concerns. In addition to these, feel free to contact me anytime you need to discuss something – by email, or by just walking past my office.

Most people struggle with time issues, which is why I share my views here. I expect you to regard graduate school as at least a full-time job. Downtime for mental refueling is certainly necessary, but I expect the typical “good” graduate student to work hard, which may require weekends and evenings. This is the standard

expectation for any good student in any decent program, and I impose the same demands on myself. I assume that a minimum workweek for a graduate student is 45 hours. Consider that 3 (non-research) courses require around 20 hours per week. A Teaching Assistantship (TA) requires 10-15+ hours per week. Research will require a minimum of 10 to >25 hours per week. **Clearly, however, all of these numbers will shift and evolve depending on your stage in the program.** For example, as a beginning graduate student, your available time will be largely expended in non-project coursework and TA responsibilities, and your time available for research will be correspondingly less. As you progress through the program, your non-thesis coursework will diminish, and you should spend the majority of your time on research.

If you are on a Research Assistantship (RA) or fellowship (and thus funded by grant or School money), you should be spending >20 hours/week on research (during the school year), and full time if it is during the summer. Furthermore, if I am funding you on a RA, your duties may include both work related to your own thesis project **and** research tasks that I assign. Remember that a RA or TA-ship is a paid job, the funding that you are receiving is not easy to secure, and you should undertake the duties and commitments inherent to this job with a high degree of integrity and responsibility.

As a graduate student, you'll need to take responsibility for knowing when various university forms are due, securing the requisite signatures, and so forth. Some major milestones that you should keep in mind include the following:

Target milestones (very generalized):

Masters Students:

- Term 1 (Fall)– coursework, select research topic, committee member(s); begin literature reviews and present a paper in a lab meeting, apply for NSERC grants
- Term 2 (Spring)- coursework, write first draft of project proposal, present in lab meeting; construct timeline and review with me, apply for student research grants
- Term 3 (Summer)- update and review timeline, finalize committee, begin data collection and analysis;
- Term 4 (Fall) –update and review timeline, coursework, finalize thesis proposal; present progress in lab meeting (with committee members present); consider abstract submission / professional meeting presentation; continue data collection and analysis; apply for research grants;
- Term 5 (Spring) - update and review timeline, finish coursework, data collection and analysis, begin outlining and drafting project manuscript
- Term 6 (Summer) – finish data collection and analysis; begin project paper writeup
- Term 7 (Fall) – Complete and revise project paper draft; defend, submit manuscript for publication, depart graduate school for gainful employment!

Ph.D. Students

- Year 1 – coursework; select research topic and committee members; conduct exploratory data analysis; begin literature review for thesis proposal; apply for research grants; take certifying exams
- Year 2 – write thesis proposal, defend proposal to committee, construct timeline and review with me, apply for student research grants, begin data collection.
- Year 3 - update and review timeline, hold committee meeting for update, consider abstract submission / professional meeting presentation, complete data collection and analysis, begin outlining and drafting manuscript for first thesis chapters
- Year 4 – draft of 2nd chapter; submit manuscript(s) for publication,
- Year 5 – draft of 3rd chapter; submit manuscript for publication; complete thesis draft; defend; depart graduate school for gainful employment!

Time to degree: ~2.5 years (Masters), ~5 years (Ph.D.). It will go fast.

Intellectual Property, Authorship, Writing

I insist that all my students plan to publish the results of their research in a peer-reviewed outlet.

There are two important reasons for this; one that's important to you, and one that's important to me:

(1) You will spend significant effort on your project, and it is a wonderful feeling to see that effort translate into a high-quality publication that will benefit the scientific community, contribute to your personal

CV, and make Mom proud. If your work appears only in your thesis, it will collect dust in the university library. (Test this by inserting a \$20 bill into the library copy of your thesis, and checking back in 20 years to reclaim your cash). Further, there is no better way to learn scientific writing than to write a manuscript, and receive reviews from experts in the field. Accordingly, I require all my students to write their thesis as a manuscript (or series of manuscripts) targeted for submission to peer-reviewed journals or equivalent (e.g. special publication). You should plan to submit the manuscript about the time you graduate from the program, *which means that revision and resubmission will continue for a time beyond your formal commitment in the graduate program.*

(2) A great deal of time and money are invested in your project research, and this requires follow-through with publication of results. One reason is very practical: I must demonstrate results from funded research, or funding agencies will deny future funding. Furthermore, research is expensive, and someone – whether taxpayers (all of us), private corporations/donors, or scientific societies—commonly helps us pay for it. Hence, it is incumbent upon us to demonstrate appreciation for these funds via publication.

Papers resulting directly from your project work are yours, and you will likely (and preferably) be first author on them. If I (and/or others) have a substantial role in producing the idea, designing the project, and/or writing the manuscript (which is the case for nearly all projects), then I (and/or others) will be a co-author(s). First authorship means that you have performed the majority of the intellectual and physical effort, completed the project, and conducted the majority of the writing. If you cannot complete your work, you forfeit your right to be first author.

Writing well is a key skill that you should develop and hone during graduate school. I will help you with your writing by requiring multiple drafts of outlines, proposals, abstracts and manuscripts, and providing you with prodigious feedback on these drafts (just ask any of my former students!). I strive to be constructive in my comments; if, however, you ever feel put off by something, please let me know... in my effort to help you produce a publishable work, I sometimes get a little carried away and forget to commend the good work.

Professionalism

Part of your higher education includes developing or honing skills of “professionalism”. Professionalism includes (1) taking responsibility for one’s own actions and duties, (2) maintaining reasonable respect for and tolerance of other views, (3) a willingness to make reasonable compromises to meet shared goals, (4) a pleasant demeanor (genuine or projected), (5) a focus on accomplishing tasks as expeditiously as possible, and (6) an ability to escape, avoid, or ignore petty arguments and gossip. You should strive to project a professional demeanor in appropriate circumstances (e.g. mock or professional presentations, interviews, etc.). Note that a professional relationship does not require friendship, but should allow you to work reasonably well even with people you personally detest, or who detest you (although we all hope it never comes to that!).

A professional manner carries us through periods of disagreement and difficulty with minimal stress. It allows one to become displeased or angry with another, yet avoid furious denunciation and accusation. It should allow one to calmly consider a situation and discuss it with others involved as a problem to be solved. It should allow one to invite and accept reasonable criticism as constructive rather than destructive. As a mentor, I expect to offer honest judgments about professional abilities, and to ignore issues that are irrelevant from a professional view (e.g. political or religious views).

Professional Enrichment

You should take every opportunity for professional enrichment during your graduate-school tenure. Here are some ideas for both networking and non-traditional learning:

- **Professional Societies**

Most professional societies offer great deals for student membership. Member fees are minimal, and you receive perks such as journal publications and meeting registration discounts. Some that you should consider joining include: the Canadian Meteorological and Oceanographic Society (<http://www.cmos.ca>), the Canadian Association of Geographers (<http://www.cag-acg.ca/en/index.html>) the American Geophysical Union (www.agu.org), and Geological Society of America (www.geosociety.org). Check their websites for information on meetings, student grant opportunities, publications, etc. Don’t forget internet listservs too. Among students, a tendency exists to ask “what’s in it for me?” Although you should certainly ask this, you should also look upon membership in professional societies as a means to contribute toward and further your profession; i.e., as a responsibility.

• Professional Meetings

Attending the national (or sectional/regional) meetings of professional societies is a fabulous opportunity for networking and developing interview and presentation skills, in addition to learning cutting-edge science. Each student should strive to present results of his/her research at a professional meeting at least once before departing graduate school. I will always do my best to help locate funding to enable you to attend a meeting at which you are presenting research I have supervised. In return, I expect you to do your best to be as reasonable as possible in expenses (e.g. choosing economical lodging, sharing hotel rooms, seeking good airfares, etc.). There are also many opportunities for travel grants, and reduced registration fees for fieldtrips and short courses. The School of Resource and Environmental Management is very supportive of student attendance. Other sources for aid include the University (via the Dean of Graduate Studies), and professional societies. Always plan well in advance, since many travel grant applications have early deadlines.

• Student Research Grants

Many of the professional societies offer student grants-in-aid of research, and I will strongly encourage you to apply for these, especially if other funding is unavailable. Preparing these grant applications provides a great opportunity for you to clarify your project in your own head, hone persuasive writing skills, and critically consider the resources you need to conduct the research. The GSA, AAPG, SEPM, Sigma Xi and the like regularly host student grant competitions (early year deadlines), and many of the regional sections do as well. Furthermore, students can (and should) apply for the very competitive NSERC Graduate Fellowships in their first years.

• Internships

We academics will teach you academia, but internships teach you about industry employment while simultaneously exceeding paltry pay! Accordingly, you might consider participating in an internship during your schooling, if scheduling and your desires allow. Keep in mind that some companies now hire for full-time positions from their intern pools, which means that internships could be critical for your future employment opportunities. The implications of internships and co-op positions are that your project completion date will be pushed back, sometimes by a year. I will still expect you to complete your projects and submit manuscripts in a timely manner, and therefore ask that you discuss these plans with me as openly as possible, so that we can make plans for when your research project will be completed.

• Seminar Attendance

REM has a weekly seminar to which we invite off-campus speakers to present their research and expertise. **Please attend the seminar!** Attendance bolsters student-student and student-faculty camaraderie, offers the opportunity to learn something new. I view students who regularly attend colloquium as “good” students (as opposed to apathetic ones), and I want all of mine to be good! At its best, the colloquium exposes you to new ideas and good camaraderie; at its worst, you learn how NOT to give a presentation. Despite having personally suffered through many a dreary colloquium, I still encourage you to attend as often as possible.

• Other Opportunities

Other opportunities you should be aware of include occasional seminars, workshops, and fieldtrips that crop up periodically here on campus and/or nearby. Keep your eyes out and participate as often as possible.

Rewards

Research is hard work, and you need to be largely self-motivated. There are, however, rewards—both tangible and intangible. The tangible rewards include such “perks” as pay (albeit modest) for doing something you enjoy and that is related to your chosen field, as well as buttressing your resume with a Teaching or Research Assistantship position and all publications (abstracts, papers) that represent the formal fruits of your labor. Publications are absolutely critical for any student who thinks s/he might be interested in an ultimate position in academia. Traveling to meetings to present something new is another enjoyable by-product of research, as is travel for fieldwork (usually!). Also, you can certainly request letters of recommendation from me at any time, and I will do my best to highlight your strengths in the most positive light. Intangibles include the intellectual reward of discovering something new! I hope you enjoy your research experience, and learn from it.

General Lab Rules

You may access the lab at any time for research, quiet study space, computer use (including email), or research work requiring the lab (hood space, elemental analyzer, etc.). There is a Zeiss microscope for casual use. Please obtain instructions before using any equipment. You are welcome to take over one of the file drawers not already in use in the computer room – please obtain a key and place your name on the drawer. Be respectful in use of lab space and equipment. **Keep work areas clean**, and compartmentalize your workspace—do not monopolize large areas. Respect others' workspaces as well. This applies to computer space and usage as well. Do not put extraneous items (programs, personal files, and especially no music/video files, etc) on the computers. **Please do not loan your lab key to another without prior consent from me.** Do not remove any equipment from the lab. You may use the A/V projector, but please ask me first. If a piece of equipment needs attention, let me know.

Despite all of our best efforts at keeping the lab reasonably organized, it will undoubtedly need a cleaning and organization now and then. Accordingly, we'll hold a lab "party" each semester during one of the weekly lab meetings.

Weekly Lab Meetings

The COPE lab holds a weekly lab meeting at a time when all students are able to attend. These meetings are extremely important for our research group, and so I ask you to make every effort to attend **all** of them. The objectives of these meetings are several: (1) to give me a chance to hear how you are progressing; (2) to provide an opportunity for students to discuss any issues/problems; (3) to give students ample opportunity to make presentations during their tenure as graduate students; (4) to allow us to build on our knowledge of group and outside cutting-edge research; (5) to build a sense of community within our lab group. I hope that you find them as useful as I do.

Safety

Safety is key! If you work in the wet lab at all, you **MUST** take and pass the Laboratory Safety and Hazard Communication training. Learn and practice safe laboratory procedures, and know what to do in an emergency. We will instruct you on procedures specific to your work, but some general good practices are as follows: Wear gloves, eye/face protection, a lab coat, and close-toed shoes (not sandals) when using chemicals. Ask before attempting anything that might cause you or others harm. Be sure you know the rules (check the MSDS sheets) before handling any type of chemical (in various states—liquids, gases, etc), and apprise me of what you are dealing with so that we both know the procedures.

When performing fieldwork, you should *always have a field assistant*; I will try to recruit others to help you in the field if you are having trouble securing an assistant. Please practice common-sense safety such as always wearing seat belts, taking a phone with you, maintaining a healthy respect for wildlife.

Resources

Take an active role in planning your career by investigating guides and resources compiled for students. I've posted several resources on our group webpage at: <http://rem.sfu.ca/COPElab/mentoring.html>
The internet provides some places to start:

- • The National Academies (<http://nationalacademies.org/careerguides.html>) has links to online versions of its several useful publications dealing with career planning, mentoring, ethics, women in science, etc.
- • The American Association for the Advancement of Science (<http://www.aaas.org/careercenter/>)
- • The National Association of Colleges and Employers (<http://www.nacweb.org/>).
- • Also check the professional society web pages that are immediately relevant to your work.

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