Jones Lab Procedures and Policy

OMNR-Trent River and Stream Ecology

The following document contains guidelines and advice for new graduate students and staff in the lab. There is a binder containing OMNR related safety and work polices that needs to be reviewed. This binder is in my office. A form in the front of the binder needs to be signed by the student acknowledging that that material has been read and they understand requirements. Please let me know if you have any questions.

New Student Orientation: Attend Environmental and Life Sciences Program new student orientations. Read the Calendar and the departmental handbook for graduate students so that you understand the course requirements and other responsibilities of graduate students in our department. Seek advice from senior students who will know requirements and the value of courses offered.

Graduate school is not a 9-5 job; it involves late nights and weekends but in the end you get what you put into it. Focus on your research, but also take in what the university has to offer. Science is a collaborative and social activity. This means attending open seminars and defense exams and extracurricular activities such as the Ontario American Fisheries Society Annual Meeting. Ask other students for help and advice, and reciprocate when you can. Brainstorming is a great way to sort out your ideas, develop some new ones and improve your ability to communicate with colleagues. If the opportunity arises, assist others in their fieldwork for short periods. This may provide you with a (much needed) mental break and expose you to different, interesting research. Getting involved creates synergy and will enhance your skills, network of colleagues, and understanding of science.

Finances: The supervisor must guarantee a portion (~50%) of the stipend. In many cases I will do my best to find full stipend support so that you can focus entirely on your thesis. If I find full support I expect that you will not teach. If you find full support then teaching is up to you. Investigate other sources of funding e.g., bursaries, scholarships.

Your Safety: Getting fieldwork done is great but getting it done without damage to equipment or personal injury is the best. Always consider the risks associated with any activity and take the necessary precautions: which might mean not doing the work. Safe practices are of prime importance when working in aquatic systems. Field personnel must have adequate training for the equipment they are using. Crews must work in pairs at all times and avoid situations that pose high risks. OMNR now has several safety operating procedures available for guidance on safe practices. Hazards associated with sampling streams include slipping and falling, strong flows, underwater obstructions that can be tripped over when wading, and deep pools. It is important to enter streams cautiously if the bottom is not visible; check the depth before entering using a stick, or some other device. Fatigue often leads to poor judgment and injuries so keep work hours (and post sampling activities) reasonable. Electrofishing units can only be used with the required training and OMNR guidelines must be followed. We require all students to have First Aid and CPR training. OMNR offers these courses at least once a year.

Animal Safety: Once enrolled at Trent and if working with fish, then you will need to prepare a animal care proposal. Basic training in Animal Care and Use is a requirement for anyone working with live vertebrates for teaching or research purposes. Completion of the appropriate modules on the Animal Care WebCT course meets the basic requirements before work under an approved protocol may begin. We must ensure that use animals in research are meeting “best

practices" for animal use, care and husbandry and ensure compliance with the Animals for Research Act and its associated regulations.

Vehicles and Boats: OMNR vehicles are for work related uses only. Operating boats requires at least a Boat Operators Card, preferably a MED3 operator's certificate. Personal floatation devices must be worn at all times while in watercraft. OMNR offers these courses once a year.

Equipment and Books: Try using the Bata Library first to get books. Books can be borrowed from my office but you must sign them out and return to me in due course. Equipment generally does not need to be signed out but you must coordinate equipment use with OMNR staff and fellow students. More importantly, take care of the equipment you use e.g., cleaning, maintenance, batteries, etc and return it to its original location in good working order ready for the next use/person. Pay particular attention to wet gear that will get moldy and destroy electronics. Equipment must be secured and protected during travel to and from the sampling site. When equipment fails to operate, inform OMNR Lab staff immediately so that servicing can begin. Notify me when consumables are getting low e.g., ethanol. All uses and ordering of ethanol must be logged in the Aquatics Lab downstairs. Be respectful of others working in the lab and the space they might require.

Invasive Species: Cleaning Equipment Between Sampling Sites
Aquatic organisms that are introduced into a new stream they may disperse throughout it and other streams. Thus, to minimize transfer of organisms between streams, it is important to clean equipment that contacts the water before going to a new site. This is particularly important when working between the north and south of Ontario. Before leaving the stream at the end of the day, use water from the stream to wash the soil, vegetation, and other debris from the sampling equipment (e.g., nets, measuring instruments, etc.) and waders. Heavily contaminated gear can be treated with dilute bleach.

Committee Meetings
Your supervisory committee is there for guidance, advice and to ensure that your thesis is of a certain caliber representative of the school. The committee is also there to ensure that the student follows a path agreed to by the committee and that the supervisor does not ask for too much or too little. While you might be a student at the beginning of your graduate career, by the end you should be more of a colleague and the expert on your thesis. Consult your graduate handbook for committee requirements.

Writing: Writing is not easy. Writing takes time. Most (all) M.Sc. do not appreciate the amount of effort/time required to write a paper for publication. If you think it will take two months to write-up, it will likely take four or six: no kidding. This is not like undergrad. Papers must be of high quality and thoroughly researched in order to interpret your findings and to put them into context of the science. Professionals will be judging the quality of your work, not just your supervisor or committee. Please note that it is not possible to write a good introduction and discussion without doing a lot of reading and thinking first. Start writing early. Make notes in a lab book as you read. This will help you focus your writing when the time comes. Plan on finishing early and hope to be on time. Most graduate students are easily distracted during the "writing phase" so set milestones with specific, realistic dates to finish different phases of your research and writing, and stick to them. Having a graduate degree is great but having a publication or two will separate you from many competitors. Publication means you can work at the professional level and you can write. These skills are typically financially compensated for in life.

Conferences: Informal lab meetings are a good place to present ideas/proposals/results. Conferences provide opportunities to network with colleagues and potential employers. They also give you opportunities to improve your presentation skills, to learn what others are doing and how your research fits in to the bigger picture. This also gives you an opportunity to learn about the style of scientific talks. A poster is a good way of communicating preliminary data. Talks are best for completed, near publication, papers.

Presentations: Giving a scientific talk for the first time can be a frightening experience, particularly if you have never seen a scientific talk before. Try learning from others: attend a conference before you are asked to attend and present if possible. Have your lab mates critique your talk or poster. Do not go over the allowed time and leave the opportunity for questions. See links on scientific meetings and the lab web page.

Expectations (Modified from Dr. Mark Boyce UofA)
Many new students, particularly those beginning work on the M.Sc., do not know what is expected of them in a graduate program. The first step should be to read the Graduate Calendar and the departmental handbook for graduate students so that you understand the course requirements and other responsibilities of graduate students in our department.

What do I expect from my students and staff?

- To keep me informed of research and activities. If you start going down a blind alley I won't be able to help you if I don't know what you are doing. You can either schedule regular meetings with me or schedule a meeting when you feel that you need input.

- To meet all mutually agreed on deadlines for completion of work, data compilation and analyses, reporting to funding agencies, etc.

What should you expect from me.

- To provide editing and critical input on research proposals, progress reports and analyses, done within a reasonable time.
- To discuss ideas for research.
- To discuss analysis, organization of publications.
- As much as I enjoy fieldwork, I cannot help will all the fieldwork of several graduate students … while entertaining my own fieldwork/research.

What not to expect of me.

- To give instant turnaround with feedback on proposals, please give at least a one-week notice. I may need even more time if I am traveling or extra busy.

Rights to Data and Publication
Science is a collaborative and social effort with the ultimate goal being a better understanding of how nature works. There are several steps in the process of doing science and a graduate student and supervisor may participate in all of these or only a few. I see the following as the basic steps.

1. Get an idea.
2. Figure out how to test your idea.

3. Write a proposal to a granting agency to get money so you can test your idea.
4. Overcome logistical problems in the field. Make judgments about the best course of action if things do not work out like you hoped they would.
5. Do the fieldwork.
6. Analyze the data.
7. Write up the data for publication.

Depending on where we are in our careers (M.Sc., Ph.D., postdoc, professor) we participate in each step a variable amount. For example, an M.Sc. student might be given the idea by the supervisor and be helped considerably in the rest of the steps. Usually the supervisor raises the bulk of the research money and deals with most of the financial and logistical details. Ph.D. students and postdocs are expected to be more independent in the development of ideas and analysis of the data.

In terms of rights to data and publication rights, the major priority is that data are published. There is no point in conducting research if the data are not published. Some research funds are from applied agencies that insist on publication as a term of the contract. To obtain research funds (such as NSERC) one must publish or one does not continue to receive such funds. As the holder of these grants I have a responsibility (legal and moral) to make sure that the data are published.

Here are my expectations on data ownership and publication:

1. I must first be approached directly from the person/group requesting data. A copy of all data collected (and appropriate documentation), maps showing sampling locations, and a complete write up of methods must be given to me for safekeeping in the lab at the end of each field season. This gives you a backup in case of data loss, and it allows me access to the data if you disappear, or do not plan to write up the data – it happens.

2. If the data are not written up for publication within one year of the thesis defense, or within one year of a postdoc leaving the lab, I reserve the right to publish the data with the student as co-author; order of authorship to be decided after consultation with the student/postdoc.

3. If the student does not write and defend a thesis, I reserve the right to publish the data within one year after the student leaves the department if no action has been taken by the student to publish the data (i.e., I would need to see a draft of a manuscript).

4. In situations where the student/postdoc is writing up data for publication, the following guidelines with respect to authorship will apply: a) If the student has completed all the steps (1-7) above with minimal consultation from me, then the student will have sole authorship on the paper. b) If I have provided input on several of the steps (1-7) above I would expect to have an authorship on the paper. Each student should discuss this with me and present arguments pro and con as to why they should or should not have sole authorship. Or a more comfortable approach may be to offer me the right of first refusal as a junior author—if I do not believe that I have earned co-authorship, I will refuse it. Usually dual authored papers would have me as a second author, however, in some cases I have had to rewrite substantially and reanalyze data for a paper. In these latter cases, order of authorship must be discussed again. Accepted standards in the scientific community are detailed in a 1988 article “Authorship, data ownership examined” (Science 242:258).