

**This prospectus gives our view of graduate education, and is intended to articulate expectations: what students are expected to accomplish, and what students should expect from your advisor.** Each student is different and will have different goals and an individual program. Despite differences in individual programs, my expectations for students and what students should expect from us will be fairly constant. Probably the most important thing to know and remember often is that you are in charge of your program of graduate studies. I can help in many ways, from advice to resources, but it's your program—self-discipline and self-initiative are critical to your success.

**You should be reading this document within the first year and preferably at the outset of your graduate degree.** If you are reading it later, don't worry! You will have heard about, or are doing, many of the things within the document and it is always useful to see them collected together in a brief summary – in fact, you should probably pull this out and review it at several stages during your degree program.

**Not all of what you read at the beginning will you be able to assimilate.** Based on that fact, it is your responsibility to bring this to me to discuss the details of the points made within. It is likely that many of these items you have been discussing with me, committee members, and with fellow graduate students but only between you and your advisor can you put specifics to the generalities that are discussed. This will be necessary not only the first time you read this, but at each stage of your degree program. If there are things on here that you do not feel apply to you – discuss them with me – you could be right! If there are other things that you do that are missing from this document, please do provide this feedback as well. Prioritizing is a key element in your graduate education and this document is written from the perspective of trying to impart what it takes for you to graduate and to have future success.

**Graduate Education:** Graduate education in science differs from undergraduate education in many ways. Probably the most important distinction is that an undergraduate education teaches what is known, and a graduate education teaches to identify the unknown and make it known. Science's fundamental role is to develop new insights and knowledge, and the goal of a graduate education in science is to teach the student how to be a scientist. A MS program is an introduction and should provide the student with the tools to understand the scientific method and an experience in applying the scientific method to a particular problem. Because identification of an important, solvable problem often requires some experience in a field, the MS often receives much guidance in problem selection. A PhD program aims to produce scientists, and is both qualitatively and quantitatively more involved than an MS program. A PhD is expected to make an important, original contribution to the field.

**Advising:** As an advisor, I serve a double role in graduate programs. As a mentor, my role is to support, encourage and nurture each student's development, and provide resources. As a professor, I am also responsible for evaluating the accomplishment and potential of each student. Students should expect support from advisors, but this support

may sometimes include challenges and uncomfortable advice/constructive criticism. I am also responsible for helping students develop their visions and accomplishments to meet the demands of the program. I have high expectations for my students, and work hard to provide them the advice, resources, and experience they need to succeed.

### **Expectations for all students and lab members:**

Beginning MS and PhD students should:

- ❖ Have personal motivation, curiosity, and enthusiasm for learning how the world works.
- ❖ Have a solid background in biology or environmental sciences and good communication, quantitative, and analytical skills.
- ❖ Be aware that you are a member and representative of the Gerber lab in the School of Life Sciences at ASU. It is up to you to become familiar with the way the school and the lab operate, and to participate in organized events.
- ❖ Become an expert in some aspect(s) of the way our labs function. Learn these skills from the students, postdocs and technicians who are here. Share these skills by writing a protocol, helping a fellow student learn a new technique, or by completing a common lab task that will benefit all.
- ❖ Be a good lab citizen. There are many people that can help you complete your work in the lab. Conversely, know that your actions also affect many. Remember to communicate your plans for using shared resources so we can maximize total output.
- ❖ Communicate with your advisors about your classes, research, and teaching workload. There are many opportunities and an advisor can give useful perspective on which might be the best use of your time.

### **Expectations for MS level students:**

A student completing an MS program should:

- ❖ Have a general, working knowledge of science, including its philosophy, methods, and current state of knowledge in the area of specialty.
- ❖ Have a solid understanding of the background, theory, problems, and impediments within the area of his or her interest.
- ❖ Be able to understand and use sampling procedures, basic statistics, analytical methods, and computer data analysis.
- ❖ Be familiar with and able to communicate clearly and effectively, in written and oral presentations.
- ❖ Begin to critically read the literature.
- ❖ Have accomplished the planning and execution of a substantial research project.

### **Milestones expected:**

- ❖ Coursework plan developed by end of first semester.
- ❖ Research plan developed by middle of second semester.
- ❖ Steady progress on research. [Be careful about 'side projects'!]
- ❖ Submission of chapters for publication by graduation (at least 1 manuscript).

### **Expectations for PhD level students:**

A student completing a PhD program should:

- ❖ Have a broad knowledge of the philosophy, history, and current state of science.
- ❖ Be competent in major techniques used in ecological research, including field, laboratory, statistical, and computer methods.
- ❖ Be an expert in the state of science within your area of specialty – knowing more about the subject than the committee or I know.
- ❖ Be able to think clearly, critically, and creatively – your PhD program should give you the skills to independently develop important ideas and comfortably analyze and critique the work of others.
- ❖ Routinely read the literature and keep an organized understanding of what you have read.
- ❖ Be able to communicate clearly and effectively, in written and oral presentations.
- ❖ Have accomplished the inception, planning and execution of a substantial research project, *independently*.

**Milestones expected:**

- ❖ Coursework plan developed by end of first semester or first year;
- ❖ Research plan initiated by middle of second semester;
- ❖ Oral exams and full research proposal by end of second year;
- ❖ Steady progress on research;
- ❖ Submission of one original research paper by the middle of your graduate program;
  - Approximately 2 more papers ready to submit near the time of graduation.
  - The number of papers would of course be flexible in cases where large (monograph) papers are produced.
- ❖ Additional papers, such as a review paper or papers as lead or co-author with fellow students and mentors, will immensely improve your marketability after graduation.

**Expectations for advising:**

My role as an advisor is to:

- ❖ Take a personal interest in each student’s education, including goals, areas of interest, and abilities.
- ❖ Challenge each student to achieve and encourage independent thought and action and provide space for the student to make mistakes.
- ❖ Provide feedback on progress, and critique written and oral presentations in a timely manner.
- ❖ Provide critical and constructive reviews of student outputs and ideas.
- ❖ Provide insights on the inner workings of science – funding, personalities, publications, manuscript review and publication.
- ❖ Work with student to arrange financial support, including tuition, stipend, research funds and travel to a variety of ecosystems and scientific meetings.
- ❖ Help students find a balance for classes, research, and teaching. There are many opportunities and an advisor can give some perspective on which might be the best use of your time.

**Workload:**

If a student uses graduate school to advance toward career goals, it’s important to develop a clear idea of the professional playing field. Good job openings have many

well-qualified competitors; a graduate program needs to produce graduates who are well positioned to win the competition. Different jobs have different emphases, but some or most of each of the following categories will be important for many different career paths:

- ❖ Quality of publications and presentations. This includes style -- but also pizzazz of the topic (hypothesis, question examined, context of the question, etc.)
- ❖ Number of publications.
- ❖ Successful participation in grant-writing activities at the appropriate level (i.e. graduate student grants, travel fellowships, summer research grants, etc.)
- ❖ Teaching experience (multiple forms including: lecturing, teaching assistant, mentoring undergraduate students, etc)
- ❖ Presentations at meetings, and other direct ways of developing personal contacts with peers and with people that may hire you
- ❖ Breadth and depth of experience, including multiple ecological questions and ecosystems.

### **Resources for graduate school and beyond:**

Ford, E.D. 2000. Scientific method for Ecological Research. Cambridge University Press.

Bloom, Dale F. et al. 1998. The Ph.D. Process: A student guide to graduate school in the sciences. Oxford University Press, New York.

Medawar, P.B. 1981. Advice to a young scientist. Basic Books. Very good, simple advice about starting to do science.

Oliver, J.E. 1991. The incomplete guide to the art of discovery. Columbia University Press.

Peters, RL. 1997. Getting what you came for- the smart student's guide to earning a Masters or PhD. Farrar, Straus and Giroux.

Reis, Richard M. 1997. Tomorrow's Professor – Preparing for academic careers in science and engineering. IEEE Press.