Welcome to the Turner Lab!

[*Updated June 2024, and always subject to additions and changes!*]

Mission Statement. The Turner Lab strives to do high-quality ecological science; to prepare graduate students for their chosen career paths by fostering technical excellence along with the suite of skills required for a successful career in science; to fledge capable independent scientists; to support one another as we work toward our goals; and always to maintain a supportive, collegial and collaborative albeit challenging environment.

What I expect from you as a graduate student.

- ***You will take ownership of your educational experience.*** Learning how to conduct research, from inception to publication, is very different from taking classes. Research is fun, but it is open-ended, long-term and challenging. You have chosen to become a scientist, and your curiosity, initiative, self-motivation and commitment are keys to your success. Success also depends on your ability to seek regular feedback and to accept constructive criticism.
- ***You will develop your personal research and professional skills***. You will develop your ability to read and understand the scientific literature, learn how to generate research questions, plan studies (field work, experiments, simulations), analyze data, interpret findings, present your work in both oral and written form, and publish your research in the peer-reviewed literature. You will set and meet goals within appropriate timelines.
- ***You will contribute to the lab and be a good lab citizen***. We sometimes say "science is a team sport" and we are very much a team. Your lab group becomes a work family, and everyone must contribute to shared tasks and to maintaining a positive environment. Our research is often collaborative, but we also learn a lot from each other even when we work on very different projects. You will treat others with respect and foster a positive work environment.
- ***You will maintain high ethical standards.*** You are expected always to be honest, to respect the intellectual contributions of all lab members, and to learn and abide by ethical standards for research, publication and professional conduct.

What you expect from me as your advisor and mentor.

- ***I will mentor you in your research and toward achieving your professional goals.*** I will help you to define your research questions, present your work at scientific conferences, to hone your writing skills, and encourage development of the professional skills needed for success in your chosen path. I will do my best to provide necessary resources. I am committed to your career development and will maintain a relationship based on trust and mutual respect.
- ***I will be available for regular and informal meetings and will provide timely feedback on your research.*** I do my best to maintain an open-door policy and am always up for discussions or answering questions at lunch. I strive never to be a bottleneck for getting feedback to my students and collaborators.
- ***I will maintain a lab group culture that is intellectually stimulating, positive and fun, challenging but supportive, and safe for all.*** I will define expectations of conduct within the group and be open to your suggestions on how to improve your experience in the lab.
- ***I will be open and honest with you and will promote all ethical standards for conducting research and engaging in scholarly activity.*** I hold myself to the same standards and will always do my best to lead by example.

What to Expect While Earning your PhD in the Turner Lab – An Informal Summary

First year – Classes, TA and research planning

Fall semester, yr 1:
Take classes, TA, attend seminars on campus, form your committee, submit fellowship applications, if appropriate. And don't forget to explore Madison!

Turner lab students typically TA early during their graduate training; your time is already fragmented by classes, and so teaching can be less intrusive than when you are farther along. Integrative Biology requires at least one year of TA as part of your professional training; most students TA for 2-3 years, on average. Your initial classes will be determined in consultation with Monica, but ultimately your PhD advisory committee will approve your overall program of study. You are encouraged to take the "Intro to Ecology Research at UW-Madison" 1-credit graduate seminar, and many students take a year of statistics (571/572) and another class during fall and spring of their first year.

Time management is important, even this early! The TA demands are not trivial, and you should be very conscious about how you manage your time – this skill is absolutely critical to success in science. And, now that you're in grad school, it is very useful to read through the AGU book, NAVIGATING GRADUATE SCHOOL AND BEYOND (Christopher 2012). It's also good to re-read the TURNER LAB LEGACIES, written by former lab members, which you probably read when you were searching for graduate programs. Visit our lab web page, the link is between the current lab members and the alumni. A long with the humor, there is rock solid advice from your peers.

Ongoing expectations that begin during year 1 include: Attend and contribute your thoughts and ideas to our weekly lab meetings; lead lab meeting at least once, possibly twice per year (includes summarizing what you did previously or last field season; status of analyses/interpretations; proposal ideas; etc.). Expect to meet "formally" with Monica at the beginning of each year to review your status/accomplishments to date, look at the big-picture plans for what you will accomplish during the year, and review your CV. There are also lots of opportunities to talk informally (e.g., while eating lunch in the lab) and to meet with her as needed. Join activities that help you to get to know your lab mates and other graduate students socially; time at the Terrace is worthwhile! Also, be prepared to submit an annual grad student progress report to the department each spring—you are responsible for making sure you attend to program deadlines and remain in good standing. Stay up to date with iBio graduate program: https://integrativebiology.wisc.edu/graduate-program/

Forming a committee – think about the areas of expertise you'd like represented among the 5 members, discuss ideas with Monica, and talk to other students about which faculty are really good on committees. You may ask faculty from all over campus (in Integrative Biology, only your advisor must be from the department). After you and Monica agree on the list, put together a one-page brief prospectus on your research ideas and your CV, and include these when you ask faculty to serve on your committee. Note – it is a good idea to have Monica (or others in the lab) review your CV for format, groupings, etc., as now is the time to make sure you have a professional-looking CV and are tracking things correctly.

Lab logistics – Please also see our separate document regarding local logistics and expectations.

Spring semester, yr 1:
Plan your first field season or summer research effort; TA; schedule and hold a committee and certification meeting, and possibly take your qualifying exam. (That must be completed by your 3rd semester, but it is a diagnostic exam that informs coursework selection. If you already have a MS, Monica will usually encourage you to take this in spring; if not, then in fall of year 2).

There is a standing joke that finding a time that works for all of your committee members to meet on the same date, time and place is a larger hurdle than either the exams themselves or the research. There is good reason for this amusement, as UW faculty members are active scientists who have very busy schedules. Therefore, SCHEDULE EARLY! It is easy to cancel a meeting if it is not needed, but if you know you want to meet in March, send the email to find a date/time by mid January. Don't wait until the last minute, as it is much better to have the slots on faculty calendars. Check your schedule and Monica's first, then offer a range of windows that work for us to the others. (Using *whenisgood* is easy, always be careful not to make it infinite in length…)

The first committee meeting – this is where we have the first "official" discussion of your research directions and program of study (i.e., courses) with the committee, and you complete the PhD Certification Form. Typically, this would be a 1 to 1.5-hr meeting (unless it is combined with your Qualifier.) There are several items that you will prepare ahead of time, and distribute to the committee: current CV; short research prospectus; draft version of the Certification Form, with an extra blank signature page; summary of your prior coursework (undergrad, grad, and UW) and intended courses, categorized by general topic (e.g., ecology classes, quantitative classes, general science, etc.). Note that you must have at least 4 of your 5 committee members lined up for the PhD certification and for the qualifying exam; if you know all 5, it is best to have them all present. If there is some uncertainty about what expertise will be best for the 5th member, then proceeding with just 4 is fine.

The Qualifying Exam – Integrative Biology uses this as a diagnostic (is the student prepared/qualified to undertake their doctoral studies?) rather than an exam to determine mastery. It should be taken early (typically during the 1st year, and definitely by the 3rd semester) and is an oral exam of about 2 hrs. It is sometimes combined with the Certification meeting. How much should you study? Not excessively, but you should review enough to feel somewhat comfortable with ecology. TA experience is excellent preparation, as is reviewing general ecology books, Foundations of Ecology, etc. Ask your committee members what they expect of you ahead of time. NOTE: bring the qualifier form (departmental) to the exam and the rubric.

Summer, yr 1:
Full-time research!
You will most likely be on RA for the summer. NOTE: Remember that you must register for summer research credits (Zoo 990) if you are on assistantship! This holds for all summers.

Second year – Classes, TA, research

Fall semester, yr 2:
Take classes, TA, analyze data from first field season, continue planning your research; submit any appropriate graduate fellowship applications.

This is likely when you have real or preliminary data to work with, and when the remaining components of your PhD study begin to be take shape. You may begin to draft your prelim proposal, and (if you've not done this previously) read examples of other excellent PhD proposals (more info under Prelim Exam, below). You will be analyzing your data, and (depending on what you accomplished in year 1) thinking about the first manuscript that you will lead. Publishing early and often is a habit you want to establish (though you really aren't pressured to do this yet!)

Monica will again meet with each student at the beginning of the academic year to review annual and semester-long goals, re-visit your CV, and discuss the opportunities and skills you want to develop during your graduate school career so that we make sure to work those in. Students have varied professional aspirations, and the goal is to provide you with the strongest foundation possible so that you are well prepared for your next step.

The UW-Madison Graduate School has developed many useful resources, and now is the time to make sure you are familiar with them.

Turner Lab Bucky Awards – Remember to give Bucky (in our lab) a new tag whenever you submit a manuscript! You then get to consume or share whatever is under Bucky (and replace with another beverage that will go to the next person who submits his/her paper). Rationale – no paper ever gets published unless it is submitted, and that's the big hurdle. (For every good study, there is home – even if it's not the first journal you tried.) We celebrate our successes!

Spring semester, yr 2:
This will generally be your final semester of classes, although most students will take seminars subsequently, and possibly Delta classes or seminars (focused on teaching). Most students draft their first manuscript by the end of this academic year and before summer research begins. If you have a MS, you will typically write your prelim proposal and complete your prelim exam. If you did not earn a MS degree previously, you may be finishing classes and completing your prelim exam during the fall semester, yr 3.

The Prelim Exam – This exam is focused on your research and is a defense of your proposal. It cannot be taken before the student has completed required coursework, or is in the final semester of required classes. You will develop a well-crafted research proposal, at the level that would be expected for a typical NSF proposal. Monica will work closely with you in developing the questions (harder than it sounds!) and learning how to write a good proposal. This is an iterative process, and the proposal won't go to your committee until it is in excellent shape—and this task definitely falls in the "learning by doing" category. There are numerous examples from the previous PhD students in the lab to give you a sense of what is expected. You are typically

aiming toward 3-5 scientific papers from your PhD, which you'll target for submission to appropriate (and often highly ranked) journals. Lengthwise, the proposal should not exceed 15 pp (single spaced) excluding references, but including any figures, tables, preliminary data, etc. This is the length is typical for standard federal proposals, and thus you will have to write to this length when you are out in the real world of science. You will give the proposal to your committee members 2 weeks before your oral exam; in practice, this means you are working with Monica on the proposal for a few months before that date. The oral exam is usually blocked out for 3 hours, and you will give a presentation of your proposal (usually ~25-30 min total), and then you answer questions from the committee for about 2 more hours. Plan to practice your presentation at lab meeting a week prior to your proposal. NOTE: You must request the Prelim Warrant in advance from the Graduate School, and then remember to bring it to your prelim! There is also now a rubric that the committee must also sign, so remember to request and bring that also.

The proposal and prelim are very important components of graduate training. When you finish your PhD, you are expected to know how to write good (and fundable) proposals, and this is not a skill that is taught in classes. Also, this is when you seek and benefit tremendously from the input/expertise of your committee members. Always remember that you want the input early, and you want to be challenged here (among your friendly, supportive colleagues!), so that your science is as compelling and rigorous as possible, and you are prepared for questions/criticisms from the outside. It is also important to know that you will get questions for which you do not know the answer; the committee will probe the edges of your knowledge. In my experience on committees, there are always some questions for which I also do not know the answer. Once you finish your prelim, you are officially a dissertator--that means all that remains is to finish your research and write your papers (dissertation)! Another big plus is that university SEG fees are reduced substantially for dissertators.

Conferences – If you have substantial progress on what is likely your first paper, you will be encouraged to submit an abstract for presenting your research at a conference, such as the annual meetings of the Ecological Society of America (ESA), International Association for Landscape Ecology – North America (IALE-NA), or other relevant professional society. Again, you will develop your abstract with your coauthors and request feedback from your lab mates. As conferences approach, we also all practice our talks for the lab group, usually a week in advance. My draft presentations have <u>always</u> been improved by feedback from the group.

That first manuscript – Writing that first paper is a new challenge for most students. Understanding how to distill the work and find the truly new insights, the level of detail to include and precision of terminology that is required, how to make the story flow logically and be written in a compelling manner, and how to place the work in context of the current literature are all skills that you will continue to improve throughout your career. Writing well is a skill you develop by doing (not just thinking about it) and by learning from more experienced scientists; anticipate multiple iterations with Monica on your papers, especially the early ones. This is normal! Avoid perfectionism, and instead share ideas and drafts often and early; seek out (do not avoid!) the feedback. You should expect that of me, and we share the same goal.

Summer, yr 2:
Full-time research, and probably a professional conference (e.g., ESA)

Years 3, 4 (and maybe 5) – Research!

All semesters, summer, etc.
Research (i.e., data collection, analysis and writing), professional meetings, publication; meet with committee annually for progress report, update, soliciting input. Minimal classwork, lots of professional development. Consider submitting an external proposal that aims to support graduate student research, or seek other opportunities (feathers in your cap are always good!) Meeting annually with your committee is also required, along with the annual progress reports to the department.

Not to be a broken record, but Monica will again meet with you at the beginning of the academic year to review annual and semester-long goals, re-visit your CV, and discuss the opportunities and skills you want to develop during your graduate school career so that we make sure to work those in.

This time is primarily devoted to research and communication. Your funding will likely be some combination of TA, RA and/or fellowship, depending on your particular situation. You will continue to be learning a lot about the practice of science, i.e., professional development associated with data analysis, reading and synthesizing literature, giving oral presentations, writing, reviewing, responding to reviews, and starting to develop your own publication record. The training of a scientist is much like an apprenticeship, and there are many dimensions that are learned by working closely with those who have more experience -- it is not about the "book learning." You also become an experienced leader among the cohort of graduate students, and sometimes have opportunities to assume leadership responsibilities on campus (e.g., graduate student leader in iBioGO, perhaps a student member of a faculty search committee) or off campus (several of our alums have been elected grad student reps to US-IALE, some students have been active in LTER network activities, another has served as chair of the student section of ESA). Presenting your work at professional meetings should be worked into your planning horizon (e.g., US-IALE, ESA, AGU or others), and you should be considered for any student presentation awards, and actively network at meetings. Submitting papers is a priority during this time. And always keep your committee up to date, circulating your manuscripts for comment prior to submission, and sending them PDFs of the publications. It is also good to re-visit the notes from your prelim exam (perhaps do so each year), and make sure that you are steadily addressing any of the suggestions or requirements of your committee.

For many students, this period is challenging. Without the structure of courses, your schedule is much more open ended, and your time, your productivity, etc. depends on YOU. Research is open-ended and happens over a longer time frame, and the process is relatively new. ***Again, time management, self-motivation and organization are key to success. So is perseverance.*** Things don't always work as expected, data are often messy, and writing can be intimidating to some; that's when you really need to keep your nose to the grindstone. Read widely, think creatively, share ideas/syntheses with other students and faculty, but keep at it! Make sure to read beyond your particular system, as the best introductions and discussions of papers place a particular study in the context of the broader field of ecology. And, as is often repeated, "Do not let perfection be the enemy of the good." Share your work early, don't expect it to be perfect, and

don't cringe when you get constructive (even if critical) suggestions—this is how science works. Although it seems scary at first, you build confidence by engaging actively in challenging discussions and by knowing your work has been subjected to a lot of constructively critical scrutiny and passed muster.

Organize your data and generate good metadata. This is a critical time for making sure your data are well organized—don't put that off until the end, develop the good habitat of creating excellent metadata as you go along. We follow the template from the Environmental Data Initiative, which is where we are depositing our data. All federally funded research requires data access, and many journals similarly require the link to the data prior to publication. This is now a standard expectation in science, and you should cultivate good data-management habits early.

Seek opportunity. This is also the prime time to think about the types of ***added experiences*** you wish to gain while in grad school. For some students, this is more formal training in pedagogy (e.g., Delta program, mentoring undergrad research projects, etc.). For others, it is the chance to be a leader in some capacity in a professional organization, or a desire to conduct a study in a different type of system, or take advantage of a key short course on particular skills (Bayesian models, isotope analyses, etc.) Yet others seek an opportunity to visit another institution. These are excellent topics to discuss with Monica at the beginning of each academic year. In addition to research excellence, there are other skills to hone and additional tools you might want in your scientific toolbox. The "right" experiences will differ among students based on their professional goals, and the key is developing the strongest foundation for what you want to do.

Honing your skills in **science communication** is increasingly important. Not only are scientists expected to write clear, compelling papers on their excellent studies, we are also expected to communicate to a wide range of audiences. These might include civic groups, K-12 students, elected officials, agency staff, journalists, faith communities, and the public at large. Learning to communicate science to non-specialists and how to scope out the "broader impacts" of your science has become critical. Take advantage of workshops and opportunities at conferences like ESA, and embrace opportunities locally to engage with the wider world.

As you near the end of the PhD, you'll also begin ***applying for postdoc*s** or other positions. Your productivity in grad school is the best indicator of your success at the next step, so it is critical to get those papers submitted and published; success breeds success. The PhD alone is a ticket to play, but where you go next depends on what you have done during your PhD; past productivity is the best predictor of future productivity. Publication (in good journals, not the predatory "pay to play" journals) is the main currency of science. Again, always strive for high-quality science that is published in a timely way; this is everyone's best interest (but mostly your own!)

The Exit Colloquium – Integrative Biology PhD students give a public seminar of their doctoral work, and most are both in-person and live-streamed, allowing friends, family and colleagues who are not in Madison to participate. Special seminars are now the more common approach, with the open/public seminar occupying the first hour of your defense and the closed session with the committee occupying the next 2 hours. Schedule early once you know when you want to give your seminar, as the schedule fills quickly!

The Dissertation and Defense – The dissertation is the collection of papers from your PhD work, and you must be the lead (though not the sole) author on each paper in the dissertation.

Typically, there are 3-5 papers in a dissertation (with 3 being the minimum—but perfectly acceptable—number, assuming that each of them is "meaty;" we don't do the "salami slicing" approach of least publishable units, and each paper within a dissertation is substantive.). Very often, at the actual defense, students have one or two papers already published, one or two that are in press or in review, and a final one that was written most recently and still to be submitted. The Dissertation also includes introductory and significance chapters (these are brief). The committee receives the full dissertation two weeks before the defense. The defense is oral, with a presentation by the student and questions from the committee. Plan on a 3-hr block of time for the defense. NOTE: Your Defense Warrant must be requested in advance from the Graduate School, and then remember to bring it to your defense, along with the rubric.

Based on the recommendation of one of the PhD students in our lab, I also recommend reading about the snake fight portion of your dissertation defense:
http://www.mcsweeneys.net/articles/faq-the-snake-fight-portion-of-your-thesis-defense

"Walking" at graduation – After all is done and deposited (or even if it's still planned for summer), you can attend the Friday night PhD graduation ceremony at the Kohl Center!

Lab Legacy – These are on the People Page of our lab website, and were started at the suggestion of students who came before you. You probably read through these when you were deciding where to apply for graduate school. This is your chance to speak to students who will follow you, sharing advice, reflections, jokes, or whatever. These are fun for prospective lab members to read, and they give current students the flavor of your era in the lab. So, do it!

All years, all lab members

Diversity, equity and inclusion. Our lab, department and UW-Madison are committed to diversity, equity and inclusion and to creating and maintaining a positive and supportive work environment. Discrimination, harassment and bullying are not tolerated. All members of our lab group are expected to act professionally, respectfully, and courteously; to support one another and be equitable and fair; and to give and receive constructive feedback (necessary in science!) focused on the content, and not the person.

Scientific ethics. Adherence to UW-Madison standards of academic integrity and professional codes of ethics (e.g., Ecological Society of America, American Geophysical Union) is expected.

The following summary of Principles from AGU (2017) is excellent:

- Excellence, integrity, and honesty in all aspects of research
- Personal accountability in the conduct of research and the dissemination of results
- Professional courtesy, equity, and fairness in working with other
- Freedom to responsibly pursue science without interference or coercion
- Unselfish cooperation in research

- Good stewardship of research and data on behalf of others
- Legal compliance in all aspects of research, including intellectual property
- Human approach in evaluating the implications of research on humans and animals.
