Mentoring Expectations
Professor Andrew Richardson

v. 0.1 12 May 2022
v. 0.2 4 September 2022
v. 0.9 6 October 2022
v. 1.0 8 October 2022

I have drafted the following document to clarify my expectations of students, postdocs, and other early career scientists I mentor, and to describe the commitments I make when I agree to serve as your mentor.

To ensure a mutually agreeable mentor-mentee relationship, the mentee is recommended to draft their own statement of expectations. Your statement of expectations does not have to be wholly original or creative—you should feel you can ask other members of the lab for their statements, and (with their approval) you should feel you can pull ideas from those statements as you assemble your own statement of expectations. Your statement should explicitly address both the expectations you have of your mentor, and what you commit to doing in return.

This document concludes with a Mentoring Contract, to be renewed annually and signed by both the mentor (me) and the mentee (you) at each renewal. The mentoring expectations documents should be initialed by both parties.

Expectations I have of you:

- Be on time for our meetings, and prepare an agenda in advance, which you share with me via email or Slack or some other agreed-upon medium.
- Treat all members of the lab group with respect.
- Don't look to others to do your work—this includes mundane tasks such as sample preparation and laboratory analyses that are required for your project, as well as data entry and checking, dishwashing and cleaning, putting away tools and equipment after a trip to the field, etc.
- Contribute to the larger lab group as a citizen. This means regularly participating in lab activities (meetings, informal get-togethers, etc.) and assisting others when your expertise, creativity, or helping hands are needed. You should embrace the opportunities we have to meet with scientists from outside NAU—happy hours and meals with visitors and speakers are a great opportunity to build your network.
- Abide by NAU's policies related to Academic Integrity, as well as the ethical standards of our major professional societies (e.g. AGU, ESA).
- Act in a professional manner when interacting with colleagues outside of the lab; this includes in-person meetings as well as online meetings, as well as on campus and off campus, and at workshops and conferences.
- Respect my time. Don't come to me with last-minute requests (e.g., if you would like to attend a conference, we should discuss that at least a month before abstracts are due, and you should aim to have a draft abstract ready at least 2 weeks before the final deadline). Don't submit an abstract (or a manuscript) without my (and or any other co-author's) review and explicit approval.

- Ask questions when you need help! If I'm not the right person to give you what you need (e.g., vacuum line training), I will try to point you towards someone with the right expertise. I will also help connect you with other experts—both at NAU and more generally within our community—these people may end up being mentors, committee members, or future employers. And keep in mind that we have a lot of great resources within our lab and across NAU—so don't be afraid to ask questions of other students and postdocs in our lab, other faculty in Ecoss and SICCS, students and postdocs in other labs, administrative support personnel in Ecoss and SICCS, Monsoon/HPC support, ITS Service Now, Cline Library staff, etc.
- Polite and professional email communication. It's nice when that includes an opening ("Hi, Andrew" is fine) and a closing ("Thanks!—Alatna"), though I don't expect every email to be formal. You should reply to my emails in a timely manner, but I do not expect a reply outside of normal work hours.
- Set realistic deadlines for yourself. If you meet those deadlines—great! Missed deadlines are an opportunity for introspection. What went wrong, what might I do differently next time? Was I being overly ambitious?
- Become an expert in your chosen field. This means pursuing appropriate course work and also conducting independent study of the relevant literature. Read deeply in your chosen field of study, and become familiar not just with the recent papers, but also the older literature which is the foundation of your chosen field.
- Become proficient in related fields of study. Virtually every question we tackle in ecosystem science requires a solid understanding of how plants work, from both the plant/tree physiology and ecophysiology perspectives, and/or an understanding of land-atmosphere interactions. Keystone texts include Chapin (Principles of Terrestrial Ecosystem Ecology), Lambers (Plant Physiological Ecology), Larcher (Physiological Plant Ecology), Jones (Plants and Microclimate), Bonan (Ecological Climatology), Monson and Baldocchi (Terrestrial Biosphere-Atmosphere Fluxes), and Campbell (Environmental Biophysics), to name a few.
- Recognize that the motivation and drive to complete your degree or advance to the next stage of your career must come from inside **you**. Grit and determination are key traits you should strive to acquire; scientific expertise (and brilliance) will only get you so far.
- Recognize when you need to put in the long hours to get stuff done, and when you can take a day off as a reward for getting past a key milestone. While I don't expect students or postdocs to regularly work more than 40 h per week, there may be extended periods when you have to work 60 or 70 hours per week. Make sure that when things are less hectic, you take a bit of time off to prevent burn-out.
- Take some vacation time now and then to maintain a healthy work-life balance. Some time off around Christmas and the New Year, and in the summer, is totally reasonable. If things are going well, and you're making good progress on your projects, then you should reward yourself with additional vacation time. Generally I will leave it up to you to decide how much vacation is appropriate, but I will let you know if I think you are taking too much time off—I do expect both students and postdocs to treat their positions as full-time jobs (2 months of vacation and no publications in a year = too much time off). If you're going to be gone for more than a long weekend, please let me know (a calendar invite with the dates you are gone is ideal). Postdocs should be reporting vacation time and sick leave in PeopleSoft.

- Know that while hard work is admired, ultimately it is the ability to "get stuff done" is what is going to earn the respect of your peers and colleagues.
- Publish your work! Remember that publications are the unit of currency in academia. A PhD dissertation is expected to be 3 first author published papers. A postdoc should aim to be publishing at least one first author paper a year, but this can be variable depending on the nature of the project(s). If you plan to seek a highly-competitive academic position at an R1 school, you will need to be both highly productive *and* publishing in the top journals, and so you should think of these guidelines as an absolute minimum (I can help you set appropriate goals and targets). Students who average more than 1 paper a year, and postdocs who average more than 2 papers a year, are doing well—especially if these are in good journals[1].
- Contribute to the work of your peers. Being a good collaborator is an important skill that I want you to develop during your tenure in the lab. Coauthorship is earned by making an important intellectual contribution to someone else's project (helping out with field or lab work is, emphatically, not enough). Examples of intellectual contributions include: contributing to the design of an experiment or field study; analyzing or visualizing data in a way that provides new insight; sharing code or insight that changes the message of the paper; preparing graphics or writing substantial portions of text; providing critical and constructive feedback on drafts (but note: editing for language and style, which changes the words but not the message, is not sufficient for coauthorship). Each year we will devote at least one lab meeting to discussing the general criteria for coauthorship. Keep in mind that while editorial advice may not earn you coauthorship, you should still help your peers by providing this kind of feedback. Why? Because your papers will also benefit peer feedback, and it's a two-way street.
- Prepare an annual "personal plan" that includes short, medium- and long-term goals, as well as specific milestones for the coming year. We will review your plan together at the start of each year, and you will conduct a self-evaluation at the end of each year, which we will review together.
- Share your research progress with the lab group in our regular meetings. This will include regular opportunities to provide "brief updates," but you should also plan to give longer, more detailed presentations in lab meeting on a semi-regular basis (e.g., a 15-minute conference-style talk, or a practice run of a seminar, job talk, or defense, once a semester)
- Remember that the lab facilities, tools, equipment, and instrument are shared resources used by many different members of the lab. For example, always leave your workspace clean and organized, ensure that tools and equipment are cleaned and returned to their proper places (don't forget to put batteries on the charger!), and let me know if something

[1] What is "good"? We generally publish in the same journals that we cite in our papers, but the appropriate outlet will vary from project to project. Impact factor is a rough guide, and journals with impact factors ≥ 5 would definitely be considered "good". Everyone dreams of a paper in Science or a Nature-branded journal, or PNAS, but high-quality papers in journals like Global Change Biology, New Phytologist, Agricultural and Forest Meteorology, JGR-B, GRL, Oecologia, Remote Sensing of Environment, ESA's Frontiers in Ecology and the Environment, Plant Cell & Environment, etc. will ultimately rack up a large number of citations, too (and getting a paper in one of these is a significant accomplishment for an early career scientist!). And while I am a fan of open-access publishing, it is expensive—usually about $3000 per paper, and we can't pay that for every paper from the lab. Also I generally discourage publishing in the MDPI or Frontiers-branded journals, even though they are open-access, because they are not very selective and those papers won't stand out on your CV (though there may be instances when they are an appropriate publishing venue). If we're going to pay the money, PLOS One and Scientific Reports are better outlets.

is broken, lost, or requires maintenance. The key message is: pay it forward, and don't be selfish.

- Devote your research effort to projects that originated in my lab. If you would like to take on side projects, or collaborate with researchers outside of the lab, we should discuss this first.
- Understand that lab funds are to be used responsibly and appropriately. If in doubt, ask me. I expect all purchases to be made using lab funds to be run past me, and approved in writing or by email, before the "buy now" button is clicked. Note that NAU has specific policies regarding purchasing and travel, which you must abide by (this isn't just me being a pain). Make sure you have taken the necessary travel and purchasing training courses! If you're going to be making frequent purchases, or conducting regular field work where you may need to buy supplies or tools, ask me to help you obtain a P-Card. With a P-Card you won't have to wait months for out-of-pocket reimbursements to "make it through the system."
- Remember that safety is important. There are a lot of different angles to this. Ask for training before using the drill press, reciprocating saw, or chainsaw, or before working with chemical reagents, pressurized calibration gases, or things like that. But also—be safe in the field, and while traveling, especially in unfamiliar places (in a new city—do you know how to get around safely? At a new field site—what are the risks? Altitude sickness, rattlesnakes, heatstroke or extreme weather, biting insects, thunderstorms?). You should have a "Fieldwork Safety Plan" for all trips to the field. While it may not always be possible for teams of two to go in the field, it's definitely wise—and if you want a lab mate or friend to accompany you, I'm happy to talk about it. Sharing rooms while traveling is fine if both parties agree to it, but I will never force you to do so. And I won't ever expect you to do something if it doesn't feel safe (it's 6 pm and you've had a long day at SEV and you don't want to drive back that night? Get a hotel and come home the following day).
- Remember that you are an awesome and unique individual, and that I value your ideas, effort, and contributions to the work of our lab.

Commitments I make to you:

- I will respect your scientific ideas and your chosen career path, and I will do my best to support you in your pursuit of your goals, whether that will take you to a career in academia, the private sector, a non-profit organization, or a government agency.
- I will make myself available to meet with you at least once, for at least 30 minutes, each week. If you would like to meet more often or for longer, please ask. I will do my best to accommodate such requests. But, our meetings do not have to fill the entire 30 minutes, and if you tell me "I only need 5 minutes today," that is totally fine. However, I will discourage you from cancelling more than one meeting in a row, as this is a red flag for me that something is not right.
- I will not cancel or cut short meetings unless absolutely necessary (e.g., a sick kid or request from a higher power (director, dean, program officer, etc.) to meet at our scheduled time; cancelled meetings will be rescheduled at a mutually agreeable time.
- I will treat you with respect, but I expect you to maintain that respect through displays of maturity and independence.

- I will do my best to reply to your emails in a timely manner (usually by the end of the day; sometimes your email will get lost in my mailbox in which case I encourage you to follow up in person).
- I will recognize you have a life outside of the lab. I do not expect replies to emails or texts outside of normal working hours (e.g., nights or weekends), but I do expect you to keep up with your email and reply to my messages in a timely manner. I also expect you to let me know if you plan to be offline or away from campus for more than a long weekend.
- I will provide feedback on written work, including drafts of abstracts, prospectuses, and papers. Usually this will be within 1 week, but it may take 2 weeks or longer during busy times of the year (start/end of semester, around grant deadlines). You can expect feedback that is pointed and direct. I strive to be constructive but honest, and my goal is to help you to become a better scientist. You should seek additional feedback from other members of the lab, from collaborators, and from the rest of your committee. You should also be aware of other resources available on campus, including the University Writing Commons and our colleagues within Ecoss and SICCS.
- I will also provide feedback on practice presentations (talks and posters) for conferences, but I expect these to be presented to the lab group as a whole at least 1-2 weeks before your actual presentation so that you can incorporate our feedback.
- I am here to help you move on to the next stage of your career. I am happy to discuss different career paths, review job postings, and review your application materials. I will write you the best letter of reference that I can, but it is up to you to make my job easy by being productive and conducting high-quality work; I will not say you are "exceptional" or "fantastic" unless you have earned such praise. I close all my letters of reference by saying "I certify that I am the sole and true author of this letter" and I will not ask you to draft the letter for me (though I will ask if there are specific things you think I should highlight in my letter, and I will do my best to convey those thoughts, using my own words, in my letter).
- I will help you broaden your professional network by connecting you with colleagues and collaborators who may be able to help you advance your career. If there's someone specific you want to make contact with, let me know how I can help facilitate that—and if I don't know the person well, I may know someone else who does know them and who could make the introduction.
- I will work with you to identify academic conferences or workshops that you should consider attending. As a student you should strive to attend at least one conference every other year, while postdocs should aim to attend one conference per year. But, conferences are not boondoggles[2] and I expect you to present your work, either in an oral or poster presentation, if you are going to attend. Keep in mind that the cost for a "big" conference like AGU or ESA is pretty high (up to $3000 per attendee, once meals and lodging, registration, abstract submission, and airfare are taken into account) but there are also much lower-cost venues like NAU's Biennial Conference which can be just as rewarding and productive. I will work with you to identify funding to support registration and travel expenses, but this does not mean that funding will always be available. During (or prior

[2] **boon·dog·gle** /ˈbo͞on ˌdägəl/ **INFORMAL • NORTH AMERICAN** *noun* work or activity that is wasteful or pointless but gives the appearance of having value.

to) the conference, I will guide you through networking experiences and events, and make suggestions for how you can broaden your professional network. You will agree to appropriately prepare for conference attendance and to behave professionally at such events.

- I will do my best to provide financial support and the resources you need to do your work, but I also expect you to do what you can to procure your own support for things like summer courses, conferences, and workshops (Ecoss, SICCS, CEIAS, Biological Sciences, and the Graduate College are all potential sources; also look to professional societies like ESA and AGU for early career support, and consider applying for whatever small grants, fellowships, etc. might be relevant). Note that by virtue of holding either NAU (Presidential, T3, etc.) or external (NASA FINESST, NSF GRFP, etc.) fellowships, some students may have accesses to different resources than other students. This should be an incentive for you to apply to these fellowships (which also are a mark of distinction on your CV).
- I will do my best to promote you and advance your career, by encouraging you to participate in Ecoss or SICCS seminar series, by nominating you to make a presentation on behalf of the group at a workshop or meeting, and by sharing your work with professional colleagues. You should see this as an opportunity to become better known as an expert in your field—and not just me trying to get you to do my work.
- Diversity, Equity and Inclusion (DEI) is a core principle of Ecoss and of our lab group, and I will respect you as a person regardless of your ability, age, ethnicity, gender expression or identity, language, marital or caretaker status, nationality, culture, race, religion, sex, sexual orientation, socioeconomic status, or other unique attribute. We will work to schedule lab group DEI training sessions and I will commit to participating in those; I also expect you to participate in these as well.
- I will make every effort to consistently use your preferred pronouns—but you need to let me know what these are.
- I recognize that your time is valuable. I will not ask you to do my busy work, or other mundane tasks, unless those tasks require skills that you possess (expertise in R) and I do not, or unless those tasks are for the greater good of the lab and it is a team effort (e.g., helping me with lab organization and cleaning). Likewise, you will recognize that my time is valuable, and you will not ask me to do things that you are capable of figuring out yourself with some time and dedication. I believe that troubleshooting is an innate skill that is only learned by practice and hard work, and I don't have a lot of patience when it turns out you haven't read the instruction manual for an instrument or software, or done a Google search to see if the problem you are having is commonplace and easily resolved. But I do want to be involved in your work, and this includes visiting your field sites, planning analyses and study designs, and so on.
- If there are things you need from me that are not described above, please let me know. I am happy to work with you to figure out how I can better help you meet your goals.

Mentoring Agreement

This agreement is made between Professor Andrew Richardson and ___. We are entering into this agreement voluntarily, under the expectation that we will embark on an advantageous and productive relationship. As both parties are eager to work cohesively and without confusion, we hereby clarify several aspects of the mentorship:

Confidentiality: To ensure a healthy mentor-mentee relationship that is founded on mutual trust, confidentiality will be upheld regarding all content shared between the mentor and the mentee.

Meetings: We commit to meet at least once per week for a minimum of 30 minutes, at a pre-arranged place (or via Zoom) and time. We adhere to maintaining this schedule to the best of our abilities, and will only cancel a meeting for special circumstances. The Mentee agrees to prepare a written agenda for each meeting, and share it in advance (e.g. via email or Slack). At the end of each meeting, we will ensure each party is aware of tasks to be completed by the next meeting.

Duration of Relationship: Our goal is to maintain our working relationship until ___. Either party has the option to exit the mentor-mentee relationship prior to this time for any reason with reasonable notification. The relationship will be extended annually by mutual agreement, and both parties will sign the agreement each year as a means of demonstrating their commitment to this relationship.

Expectations: We acknowledge that we have both read the Mentor's document, "Mentoring Expectations" (dated _____) and we agree that the mentor and mentee both have obligations to, and expectations of, each other. A similar statement provided by the Mentee is attached. We have each initialed both documents to confirm our acceptance of these expectations.

Project and Goals: The primary research project on which the mentee will work is _[brief description or title of the project]_, which will contribute to their near-term goal of _[finishing their PhD / obtaining a faculty position / securing a job in industry / continuing the postdoc position for another X years]_. The mentee's main goal for this project by the end of this mentoring period is to _[complete coursework / pass qualifying exams / submit a manuscript on X / obtain funding to support Y]_. The mentee's annual "personal plan" is attached and initialed by both parties.

Additional Comments: We hope this agreement will be beneficial to both parties, and assist in the professional development of the mentee in achieving his/her/their career goals. Both the mentor and the mentee agree to be open to feedback throughout this process, and to change the agreement when needed throughout the duration of the relationship.

Professor Andrew Richardson	Date	Mentee	Date