



Introduction to Ecology Research at UW-Madison

(Agr/AtmOc/Bot/Ent/EnSt/FWE/Geo/Zoo 953)

Fall Semester 2022

Instructor:	Prof. Monica G. Turner, Department of Integrative Biology (turnermg@wisc.edu)
Credits:	1 credit
Time & place:	Wednesdays, 9:30 – 10:45 am, 158 Birge Hall
Requisites:	Graduate student status, aimed at new graduate students
Instruction mode:	Face-to-face
Canvas link:	https://canvas.wisc.edu/courses/323300

COURSE DESCRIPTION: Designed for new graduate students in ecology, primarily 1st or 2nd year students working toward an ecology-focused PhD in any department, this seminar complements the professional development seminar designed for mid-stage (e.g., third and fourth year) ecology graduate students and taught by Prof. Tony Ives. Goals for this seminar are (1) to introduce students to the rich history and tradition of ecology at UW-Madison; (2) to familiarize students with the depth, breadth, diversity, and strength of expertise among current faculty; and (3) to develop skills needed for success in a PhD program, emphasizing skills that are important during the early years of graduate school. Varied format will include faculty presentations, graduate student panels, discussion of assigned readings, and in-class activities.

COURSE LEARNING OUTCOMES: Early career graduate students in ecological fields of study will:

- Appreciate the foundations and legacy of ecology research, conservation science at UW-Madison
- Meet faculty and graduate students and gain knowledge of the diversity and strength of current research in ecology
- Compare and contrast expectations in undergraduate education to those of graduate school and research
- Develop appropriate expectations for advisors and advisees
- Solve hypothetical scenarios based on professional codes of ethics
- Actively promote diversity, equity, and inclusion of all at UW-Madison
- Identify common challenges faced by most (all?) graduate students
- Grasp the suite of skills associated with success in graduate school and in science
- Develop a sense of community amongst graduate students and in Wisconsin Ecology

OFFICE HOURS: Office hours are by appointment. Please email me to schedule a time.

HOW ARE CREDIT HOURS MET BY THE COURSE? Learning will take place in at least 45 hours of learning activities, including time spent in class meetings; tutorials; reading; writing; preparing for class; and any other activities as described in the syllabus or assigned during the semester.

READING ASSIGNMENTS AND ONLINE DISCUSSION BOARD

Readings are a mixture of scientific papers and articles and essays related to professional development. PDFs or links for reading assignments will be posted in Canvas. **Everyone is expected to have read the assignments before class and be prepared to discuss the papers. Posting comments regarding the readings or topic to the online discussion board in Canvas by 5:00 pm on the Tuesday evenings before class will be required;** weekly prompts and instructions will be provided.

CLASS PARTICIPATION

Graduate seminars are best when all participants are engaged with the material. Discussions are only effective when everyone is prepared and has perspectives to contribute. **Everyone is expected to have read the assigned articles before class and given thought to the content and context, and be prepared with questions about the topic or for the speaker.** The class benefits from the diverse

interests and backgrounds of the students, and we learn a lot by listening to one another. Students are required to post their own responses before reading those of their classmates.

ASSIGNMENTS

All assignments will be submitted online via Canvas.

ABSENCE POLICY

Attendance is expected and is recorded at each class meeting. If you have an *anticipated* absence, please let me know before the class that you will miss. If you are *unexpectedly* absent (e.g., illness), please inform me by email at your earliest convenience.

For classes that are missed, students are responsible for the material that was covered in class and must complete the readings. ***Written reactions to the assigned readings should generally be submitted within one week after the missed class, but this is flexible for any classes missed to illness. Please communicate with me about timing.*** The summary should include a brief statement of what was covered in the readings, but what I really want are your thoughts and reactions, any insights that were new for you, and questions that arise in your mind. Our class is in-person and we do not have video capture in our meeting room.

DIVERSITY & INCLUSION STATEMENT

Diversity is a source of strength, creativity, and innovation for UW-Madison. In this course and across the campus, we value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals. The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world.

GRADING

This course is graded on a Satisfactory/Unsatisfactory basis. Attendance is required, and having read the assignments and being prepared to discuss is expected. Online discussions or commentary, and short writing assignments, are also required. I expect all students to earn a Satisfactory grade. However, missed classes, late or missing discussion posts, or lack of participation throughout the semester may result in an Unsatisfactory grade.

COURSE EVALUATIONS

Students will be provided with an opportunity to evaluate this graduate seminar and your learning experience. Please complete the university's general course evaluation when you are notified that it is available. Your feedback is important!

Additional Information and UW-Madison Policies

Institutional academic policies and statements are reviewed and updated annually, as needed. Please visit the following links for university-wide policies.

- [Teaching and Learning Data Transparency Statement](#)
- [Privacy of Student Records and the Use of Audio Recorded Lectures Statement](#)
- [Campus Resources for Academic Success](#)
- [Course Evaluations](#) and [Digital Course Evaluations](#)
- [Students' Rules, Rights and Responsibilities](#)
- [Diversity and Inclusion Statement](#)
- [Academic Integrity Statement](#)
- [Accommodations for Students with Disabilities](#)
- [Academic Calendar and Religious Observances](#)

SYLLABUS - FALL 2022

Week	Date	Topic	Leader(s) & Readings
1	Sept 7	Welcome to ecology at UW-Madison, Introductions, & A City Kid Finds Ecology	Dr. Monica Turner , Professor, iBio Overview of course, intros, etc. <i>Zagorski (2007)</i>
2	Sept 14	Ecosystems, landscapes and the history of Wisconsin conservation science	Dr. Curt Meine , Senior Fellow, Aldo Leopold Foundation <i>Meine (2008)</i> <i>Meine (2020)</i>
3	Sept 21	Skills for success (e.g., time management, balancing demands, teaching, accountability, long-term goals, working remotely, giving/receiving constructive feedback, etc.)	Current Grad Students: Nathan Kiel, iBio Adrianna Gorski, FMS <i>Christopher (2011) Chapters 1, 4, 5</i>
4	Sept 28	Studying vanished ecosystems and climates for insights into our emerging no-analogue world	Dr. John (Jack) Williams , Professor, Geography <i>Chamberlin (1965)</i> <i>Williams and Jackson (2007)</i>
5	Oct 5	On becoming a scientist (e.g., generating new knowledge, learning from your system, collaboration, diversity in science, importance of questions, etc.)	Turner <i>Alberts (2009)</i> <i>Schneider (2021)</i> <i>Hansen et al. (2018)</i> <i>Dutt (2020)</i> <i>Kimmerer (2013) Three Sisters</i>
6	Oct 12	The role of conservation in the climate system. Can ecological theory improve our ability to manage the Earth system?	Dr. Paul Stoy , Associate Professor, Biological Systems and Engineering <i>Odum (1969)</i> <i>Bonan (2008)</i> <i>Cavaleri (2020)</i>
7	Oct 19	Effective advisor-advisee relationships (e.g., advising vs. mentoring, roles and responsibilities of mentors and mentees, relationship building, trust, advising styles, lab cultures, value of IDPs, etc.)	Turner, Current Grad Students: Nora Schlenker, Geography Danny Syzdlowski, FMS <i>Allis (2017)</i> <i>Christopher (2011) Chapter 3</i> <i>Sarabipour et al. (2021)</i> <i>NextGenVoices (2018)</i>
8	Oct 26	The dynamic links between a lake, a landscape, and a limnologist	Dr. Grace Wilkinson , Assistant Professor, iBio and Center for Limnology <i>Wilkinson et al. (2022)</i>
9	Nov 2	Scientific ethics (e.g., research ethics, academic integrity, professional courtesy & equity, honesty, addressing bias, duty to report, etc.)	Turner <i>Codes of Ethics:</i> <i>ESA (2020)</i> <i>AGU (2017)</i> <i>WEF (2018)</i>
10	Nov 9	Can corporate promises save the rainforest?	Dr. Holly Gibbs , Professor, Geography <i>Gibbs et al. (2015)</i> <i>Andreoni et al. (2021)</i>
11	Nov 16	Effective communication (e.g., internal and external, scientists as professional writers, honing SciComm during grad school, etc.)	Turner <i>Christopher (2011) Ch. 8</i> <i>Schimmel (2012) Ch. 1-3</i> <i>Baron (2010) Ch. 1-2</i>
12	Nov 23	No class	Happy Thanksgiving!
13	Nov 30	Plant physiological ecology	Dr. Kate McCulloh , Professor, Botany <i>O'Keefe and McCulloh (2020)</i>

14	Dec 7	Interdisciplinary ecology in the era of global change	Dr. Claudio Gratton , Professor, Entomology <i>Arts et al. (2017)</i> <i>Jones et al. (2019)</i>
15	Dec 14	Riding the roller coaster – the fun and the fear (e.g., maintaining health and wellbeing, countering perfectionism, fear of failure, importance of resilience, time management)	Turner, Current Grad Students: Carly Scott, Wildlife Ecology Seth Spawn, Geography <i>Langenheim (2010), Ch. 3</i> <i>Schwarz (2008)</i> <i>DePauw (2016)</i> <i>Powell (2017)</i> <i>Brown (2020)</i>

READINGS

Recommended (specific chapters assigned, but there's more good content! Links are also in Canvas)
 Christopher, S. A. 2011. Navigating graduate school and beyond. A career guide for graduate students and a must read for every advisor. American Geophysical Union, Washington, DC.
<https://search.library.wisc.edu/catalog/9910120827802121>
 Gray, P. and D. E. Drew. 2012. What they didn't teach you in graduate school: 299 helpful hints for success in your academic career. Stylus Publishing LLC, Sterling, Virginia.
<https://search.library.wisc.edu/catalog/9912862652902121>

(1) September 7 – Welcome to ecology at UW-Madison

Background – who is your instructor anyway?

Zagorski, N. 2007. Profile of Monica G. Turner. Proceedings of the National Academy of Science 104:4779-4781.

(2) September 14 - Ecosystems, landscapes and the history of Wisconsin conservation science (Meine)

Meine, C. 2008. The view from Man Mound. Pp. 17-20 In: D. M. Waller and T. P. Rooney, editors. The vanishing present. Wisconsin's changing lands, waters and wildlife. University of Chicago Press.
 Meine, C. 2020. The crucible of conservation: Land, science, community, and the Wisconsin Idea. Pages 120-148 In: C. A. Goldberg, editor. Education for Democracy Renewing the Wisconsin Idea. University of Wisconsin Press, Madison, WI.

(3) Sept. 21 - Skills for success

Christopher, S.A. 2011. Chapter 1 – Introduction; Chapter 4 – Skills; and Chapter 5 – Organize. In: Navigating graduate school and beyond. American Geophysical Union, Washington, DC.

(4) September 28 – Studying vanished ecosystems and climates for insights into our emerging no-analogue world (Williams)

Chamberlin, T. C. 1965. The method of multiple working hypotheses. Science 148:754-769. (Reprinted from an 1890 article by a former president of UW-Madison.)
 Williams, J. W., and S. T. Jackson. 2007. Novel climates, no-analog communities, and ecological surprises. Frontiers in Ecology and the Environment 5:475-482.

(5) October 5 – On Becoming a Scientist

Alberts, B. 2009. On becoming a scientist. Science 326:916.
 Dutt, K. 2020. Race and racism in the geosciences. Nature Geoscience 12:2-3.
 Hansen, W. D., J. Scholl, A. E. Sorensen, K. E. Fisher, J. A. Klassen, L. Calle, G. S. Kandlikar, N. Kortessis, D. C. Kucera, D. E. Marias, D. L. Narango, K. O'Keefe, W. Recart, E. Ridolfi, and M. E. Shea. 2018. How do we ensure the future of our discipline is vibrant? Student reflections on careers and culture of ecology. Ecosphere 9(2), e02099.
 Kimmerer, R. W. 2013. The three sisters. From her best-selling book, Braiding Sweetgrass.
 Schneider, D. C. 2021. Becoming an ocean scientist: learning from surprise. ICES Journal of Marine Science 78(10):3544-3551.

Recommended re: women in science/ecology:

Wasserman, E. 2000. *The door in the dream. Conversations with eminent women in science.* Joseph Henry Press (imprint of the National Academy Press), Washington, DC.

Damschen, E. I., K. M. Rosenfeld, M. Wyer, D. Murphy-Medley, T. R. Wentworth, and N. M. Haddad. 2005. Visibility matters: increasing knowledge of women's contributions to ecology. *Frontiers in Ecology and the Environment* 3:212-219.

(6) October 12 – The role of conservation in the climate system. Can ecological theory improve our ability to manage the Earth system? (Stoy)

Odum, E. P. 1969. The strategy of ecosystem development. *Science* 164:262-270.

Bonan, G. B. 2008. Forests and climate change: forcings, feedbacks, and the climate benefits of forests. *Science* 320:1444-1449.

Cavaleri, M. A. 2020. Cold-blooded forests in a warming world. *New Phytologist* 228:1455-1457.

(7) October 19 - Effective advisor-advisee relationships

Allis, C. D. 2017. On being an advisor to today's junior scientists. *PNAS* 114:5321-5323.

Christopher, S.A. 2011. Chapter 3 - Your advisor and you. In: *Navigating graduate school and beyond.* AGU Press.

Sarabipour et al. 2021. Building and sustaining mentor interactions as a mentee. *The FEBS Journal* 289:1374-1384.

NextGen Voices: Quality mentoring. 2018. *Science* 362:22-24. (*Collection of short letters from young scientists about mentoring that mattered to them*).

Useful article on relationships between STEM PhD students and their advisors.

DeWelde, K., and S. L. Laursen. 2008. The "Ideal Type" advisor: How advisors help STEM graduate students find their "scientific feet". *The Open Education Journal* 1:49-61.

Excellent reference/background:

National Academies of Sciences, Engineering, and Medicine. 2019. *The science of effective mentorship in STEMM.* The National Academies Press, Washington, DC.

(8) October 26 – The dynamic links between a lake, a landscape and a limnologist (Wilkinson)

Wilkinsson, G. M., J. A. Walter, C. D. Buelo, and M. L. Pace. 2022. No evidence of widespread algal bloom intensification in hundreds of lakes. *Frontiers in Ecology and the Environment* 20:16-21.

(9) November 2 – Scientific ethics

Ecological Society of America. 2020. Code of ethics. Available online and as PDF.

American Geophysical Union. 2017. AGU Scientific integrity and professional ethics. Available online and as a PDF.

World Economic Forum. 2018. Young scientists code of ethics. Available online and as a PDF.

(10) November 9 – Can corporate promises save the rainforest? (Gibbs)

Andreoni, M., H. Tabuchi and A. Sun. 2021. How leather seats in luxury SUVs fuel Amazon deforestation. *New York Times* 2022/11/17. Access [link](#) and PDF are in Canvas.

Gibbs, H. K., L. Rausch, J. Munger, I Schelly, D. C. Morton, P. Noojipady, B. Soares-Filho, P. Barreto, L. Micol, and N. F. Walker. 2015. Brazil's soy moratorium. *Science* 347:377-378 (plus supplemental material).

(11) November 16 – Effective communication

Christopher, S.A. 2011. Communicating (Ch. 8). In: *Navigating graduate school and beyond.* American Geophysical Union, Washington, DC.

Schimel, J. P. 2012. Chapters 1 to 3 In: *Writing science. How to write papers that get cited and proposals that get funded.* Oxford University Press, New York, NY. (*This is a terrific resource, I recommend you keep it and read the rest this year. My own copy stays handy!*)

Baron, N. 2010. Chapters 1 and 2 In: *Escape from the ivory tower: a guide to making your science matter.* Island Press, Washington DC.

<https://search.library.wisc.edu/catalog/9911070642202121>

Gruber, J., L. H. Somerville, and J. J. Van Bavel. 2020. Scientists' guide to email etiquette. *Science* (link will open in a new window)

Additional background:

Baron, N. 2010. Chapters 3 - 7 In: *Escape from the ivory tower: a guide to making your science matter*.
Island Press, Washington DC.

Developed by Compass: The Message Box Workbook.

(12) November 23 – No class, Happy Thanksgiving!

(13) November 30 – Plant physiological ecology (McCulloh)

O’Keefe, K., and K. A. McCulloh. 2020. Do invasive jumping worms impact sugar maple (*Acer saccharum*) water-use dynamics in a central hardwoods forest? *Biological Invasions*.

(14) December 7 – Interdisciplinary ecology in the era of global change (Gratton)

Arts, B., et al. 2017. Landscape approaches: a state-of-the-art review. *Annual Review of Environment and Resources* 42: 439–463.

Jones, M.S., et al. 2019. Organic farming promotes biotic resistance to foodborne human pathogens. *Journal of Applied Ecology* 56:1117–1127.

(15) December 14 - Riding the roller coaster – the fun and the fear

Langenheim, J. H. 2010. The odyssey of a woman field scientist. Chapter 3: Graduate student years, pp. 45-64. Xlibris Corporation (book is out of print).

Schwartz, M. A. 2008. The importance of stupidity in scientific research. *Journal of Cell Science* x:1771.

Powell, K. 2017. Break or burnout. *Nature* 545:375-377. (+ bonus short feature on mentors!).

DePauw, K. P. 2016. Tips for thriving in graduate school. (Originally a Twitter thread, saved as a PDF).

Brown, A. M. 2020. Data-driven advice for grad school. *Science* 369:6509.

Some additional short commentaries:

Rosen, J. 2018. [How a hobby can boost researchers’ productivity and creativity](#). *Nature Career Feature*.

Weiss, A. 2022. [Turning off my phone improved my science](#). *Nature Career Column*.

Woolston, C. 2015. [Leisure activities: the power of a pastime](#). *Nature Career Colum*.