



Introduction to Ecology Research at UW-Madison

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

Fall Semester 2025

Version: August 27, 2025

Instructor: Prof. Monica G. Turner, Department of Integrative Biology (turnermg@wisc.edu)
Credits: 1 credit
Time & place: Thursdays, 1:00 – 2:15 pm, 158 Birge Hall
Requisites: Graduate student status, aimed at new graduate students
Instruction mode: Face-to-face
Canvas link: <https://canvas.wisc.edu/courses/477153>

COURSE DESCRIPTION: This seminar is designed for new graduate students in ecology, primarily 1st or 2nd year students working toward an ecology-focused PhD in any department. 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 those skills that are especially important during the early years of graduate school. The varied format includes 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
- 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.

READINGS AND DISCUSSIONS / 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.** Some classes will begin with a brief reading quiz to solicit your reflections on the readings.

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, to have given thought to the content and context, and to come to class 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. Discussion is a key component of any graduate seminar, and we want to hear from everyone.

ASSIGNMENTS

Writing assignments will be completed during class or submitted online via Canvas. Students are expected to take notes during faculty presentations and to identify at least three key “take-aways” or lessons shared by the presenters. Writing your own notes encourages active listening, and having a goal (what points from this presentation are most salient to you?) encourages you to be intentional and attentive.

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.

USE OF GENERATIVE ARTIFICIAL INTELLIGENCE TOOLS

ChatGPT and other generative AI tools have arrived in force and, as with any new technology, understanding of their limitations and establishment of standards for ethical use of AI in science are evolving. There are many productive ways to use AI, including getting started with model code, rapidly identifying species from visual or acoustic data (think about apps like Seek), and other analysis tasks based on pattern recognition. However, this seminar emphasizes the critical thinking skills each individual needs to develop for themselves; thus, I always want your authentic responses (not the hive mind). Asking ChatGPT to summarize a paper for you does not hone your critical thinking. The abilities to read with intention, think critically, synthesize your understanding, and convey your insights in your own words are fundamental for every scholar, and it takes lots of practice to develop and improve those skills. When using a chatbot to do your writing (or thinking), you are not providing your original ideas. Furthermore, you are relying on material that cannot be verified, is often (shockingly) incorrect, and is mediocre at best. We will discuss appropriate use of AI tools during our class meetings focused on skills and on scientific ethics. However, ***the use of generative artificial intelligence (AI) tools and applications (including, but not limited to, ChatGPT, DALL-E, and others) for course writing assignments and assessments does not support the learning objectives of this course and is prohibited.*** Using them in any way for this course is a violation of the course’s expectations and will be addressed through UW–Madison’s [academic misconduct policy](#), specifically UWS 14.03(1)b (b) Uses unauthorized materials or fabricated data in any academic exercise.

ACADEMIC INTEGRITY STATEMENT

By virtue of enrollment, each student agrees to uphold the high academic standards of the University of Wisconsin-Madison; academic misconduct is behavior that negatively impacts the integrity of the institution. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these previously listed acts are examples of misconduct which may result in disciplinary action. Examples of disciplinary [sanctions](#) include, but are not limited to, failure on the assignment/course, written reprimand, disciplinary probation, suspension, or expulsion.

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 at every session and is recorded. All students are expected to have read the assignments and be prepared to discuss them. I expect all students to earn a Satisfactory grade. For a satisfactory grade, students must attend a

minimum of 10 class meetings, actively contribute to the discussion at every class meeting, and complete all assignments. Failing to do so will result in unsatisfactory grade. Actively contributing to discussion means each participant will share their insights and responses to course content, including readings and presentations. Simply expressing agreement with an assigned readings does not constitute active participation. Students who miss any class must submit makeup assignments based on the absence policy above.

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](#)
- [Accommodations for Students with Disabilities](#)
- [Academic Calendar and Religious Observances](#)

SYLLABUS - FALL 2025

Week	Date	Topic	Leader(s) & Readings
1	Sept 4	Welcome to ecology at UW-Madison; Introductions; & A New York city kid finds ecology	Dr. Monica Turner , Professor, iBio Overview of course, intros, etc. <i>Zagorski (2007)</i> Video: "Future forests of Greater Yellowstone"
2	Sept 11	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 18	Skills for success (e.g., time management, balancing demands, accountability, long-term goals, absorbing the literature)	Turner + Current Grad Students: Alli Kneisel, iBio Erin Netoski, FWE <i>Christopher (2011) Chapters 1, 4 & 5</i> <i>Calarco (2020) Chapter 4</i>
4	Sept 25	How forest soil microbes and amazing mentors helped me land a dream job	Dr. Zac Freedman , Associate Professor Soil and Environmental Sciences <i>Zak et al. (2019)</i> <i>Propson et al. (2024)</i>
5	Oct 2	On becoming a scientist (e.g., generating new knowledge, learning from your system, collaboration & diversity in science, importance of questions, etc.)	Turner <i>Chamberlin (1965)</i> <i>Alberts (2009)</i> <i>Schneider (2021)</i> <i>Kimmerer (2013) Three Sisters</i> <i>Brooks (2025)</i>
6	Oct 9	Thousands of miles away from home because of the Wisconsin School of Ecology	Dr. Daijiang Li , Assistant Professor, Botany <i>Li & Waller (2015)</i> <i>Li et al. (2019)</i>
7	Oct 16	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: Peter Conowall, FMS Arielle Link, iBio <i>Allis (2017)</i> <i>Christopher (2011) Chapter 3</i> <i>Sarabipour et al. (2021)</i> <i>NextGenVoices (2018)</i>
8	Oct 23	Falling for freshwater, my path to limnology	Dr. Hilary Dugan , Associate Professor, iBio/CFL <i>Hampton et al. 2025</i> Video (see link)
9	Oct 30	Scientific ethics (e.g., research ethics, academic integrity, AI, 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> <i>Blau et al. (2024)</i>
10	Nov 6	From pines to pathways: Rediscovering chemistry though ecology	Dr. Amy Trowbridge , Assistant Professor, Forest and Wildlife Ecology <i>Hammond et al. (2022)</i> <i>McDowell et al. (2022)</i>
11	Nov 13	Effective communication (e.g., scientists as professional writers, importance of SciComm, etc.)	Turner <i>Christopher (2011) Chapter 8</i> <i>Schimel (2012) Chapters 1-3 & 21</i> <i>Jones (2024)</i> <i>Wilson (2024)</i>

12	Nov 20	My unusual academic path to agroecology and addressing agriculture's grand challenges	Dr. Chris Kucharik , Professor, Plant and Agroecosystem Sciences <i>Kucharik et al. (2023)</i>
	Nov 27	No class	Happy Thanksgiving!
13	Dec 4	Riding the roller coaster – the fun and the fear (e.g., Staying on track, maintaining health and wellbeing, countering perfectionism, fear of failure, importance of resilience)	Turner + Current Grad Students: Timon Keller, iBio Trevor Roberts, FWE <i>Schwarz (2008)</i> <i>Gaudet (2015)</i> <i>Brown (2020)</i> <i>Cherry (2023)</i> <i>Soga and Gaston (2025)</i>

READINGS

Full books (*specific chapters assigned, but there's more good content! Links are 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>

Colarco, J. M. 2020. A field guide to grad school. Uncovering the hidden curriculum. Princeton University Press.

Recommended:

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. (*Tongue-in-cheek humor, but a whole lot of good, common sense advice; fast read*)

<https://search.library.wisc.edu/catalog/9912862652902121>

(1) September 04 – Welcome to ecology at UW-Madison

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

Link to **FUTURE FORESTS OF GREATER YELLOWSTONE**, 8.5 min video

Additional information:

Link to **THE BURN**, 4.5-minute video produced by the Franklin Institute:

<https://www.fi.edu/en/laureates/monica-g-turner>

Link to **TOMORROW'S YELLOWSTONE**, multi-media project produced by UW Madison:

<https://news.wisc.edu/tomorrows-yellowstone/>

(2) September 11 - Ecosystems, landscapes and the history of Wisconsin conservation science (Dr. Curt 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. 18 - Skills for success

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

Colarco, J. M. 2020. Chapter 4 – Reading and writing about other people's research. In: A field guide to graduate school. Uncovering the hidden curriculum. Princeton University Press.

Another very useful article, as collaboration is a key part of much of our science:

Cheruvellil et al. 2014. Creating and maintaining high-performing collaborative research teams: the importance of diversity and interpersonal skills. *Frontiers in Ecology and the Environment* 12:31-38.

(4) September 25 – How forest soil microbes and amazing mentors helped me land a dream job (Dr. Zac Freedman)

Zak, D. R., Q. A. Argiroff, Z. B. Freedman, R. A. Upchurch, E. M. Entwistle, and K. J. Romanowica. 2019. *Ecology* 100(10):e02804.

Propson, B. E., D. R. Zak, A. T. Classen, A. J. Burton, and Z. B. Freeman. 2024. Gains in soil carbon storage under anthropogenic nitrogen deposition are rapidly lost following its cessation. *Ecology* 108:e4444.

(5) October 2 – On Becoming a Scientist

Chamberlin, T. C. 1965. The method of multiple working hypotheses. *Science* 148:754-769. [*Legacy reading, reprinted from an 1890(!) article by a former president of UW-Madison*]

Alberts, B. 2009. On becoming a scientist. *Science* 326:916.
 Kimmerer, R. W. 2013. The three sisters. From her best-selling book, *Braiding Sweetgrass*. [Kimmerer is a UW-Madison graduate and [winner of a 2022 MacArthur Foundation "Genius" award](#).]
 Schneider, D. C. 2021. Becoming an ocean scientist: learning from surprise. *ICES Journal of Marine Science* 78(10):3544-3551.
 Brooks, D. 2025. AI could make us dumber. Op-ed from the NY Times.

Additional recommended readings:

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.
 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'Keeffe, 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.

(6) October 9 – Thousands of miles away from home because of the Wisconsin School of Ecology (Dr. Daijiang Li)

Li, D., & Waller, D. (2015). Drivers of observed biotic homogenization in pine barrens of central Wisconsin. *Ecology*, 96(4), 1030-1041.
 Li, D., Stucky, B. J., Deck, J., Baiser, B., & Guralnick, R. P. (2019). The effect of urbanization on plant phenology depends on regional temperature. *Nature Ecology & Evolution*, 3(12), 1661-1667.

(7) October 16 - 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 STEM*. The National Academies Press, Washington, DC.

(8) October 23 – Falling for Freshwater, My Path to Limnology (Dr. Hilary Dugan)

Hampton, S. E., et al. 2024. Environmental and societal consequences of winter ice loss from lakes. *Science* 386: eadl3211.

Link to **INTRODUCTION TO THE ECOLOGY OF WATERS OF LAKE MENDOTA**:

https://www.youtube.com/watch?v=LHqB_Z oo4s&ab_channel=HilaryDugan

(9) October 30 – Scientific ethics

Ecological Society of America. 2020. Code of ethics. Available online and as PDF.
 World Economic Forum. 2018. Young scientists code of ethics. Available online and as a PDF.
 American Geophysical Union. 2017. AGU Scientific integrity and professional ethics. Available online and as a PDF.
 Blau, W., et al. 2024. Protecting scientific integrity in an age of generative AI. *PNAS* 121:e2407886121. (editorial).

Also useful for discussion on use of AI:

Thorp, H. H. 2023. ChatGPT is fun, but not an author. *Science* 379:313.
 Florindo, F. 2023. ChatGPT: A threat or an opportunity for scientists? *AGU Perspectives of Earth and Space Scientists* 4, e2023CN000212.
 Carroll, K. 2024. Generative AI platforms and ecology. Ecological Society of America blog post from Early Career Ecologists section.

<https://www.esa.org/earlycareer/2024/03/19/generative-ai-platforms-and-ecology/>

(some other “Don’t”s from Monica regarding intellectual property – Do not upload an unpublished manuscript into any generative AI (e.g., to ask it to write a review) and never upload a proposal).

(10) November 6 – From pines to pathways: Rediscovering chemistry through ecology (Dr. Amy Trowbridge)

Hammond, W. M., et al. 2022. Global field observations of tree die-off reveal hotter-drought fingerprint for Earth’s forests. *Nature Communications* 13:1761.

McDowell, N. G., et al. 2022. Mechanisms of woody-plant mortality under rising drought, CO₂ and vapour pressure deficit. *Nature Reviews Earth & Environment*. Postprint.

(11) November 13 – Effective communication

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

Schimmel, J. P. 2012. Chapters 1 to 3 and Chapter 21 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!)*

Jones, G. M. 2024. What’s the point of peer review? *Frontiers in Ecology and the Environment* doi:10.1002/fee.2785.

Wilson, N. 2024. Predatory journals. *BioScience* 74:6-11.

Also see link: <https://predatoryjournals.org/home>

Additional background:

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

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

Developed by Compass: The Message Box Workbook.

(12) November 20 –My unusual academic path to agroecology and addressing agriculture’s grand challenges (Dr. Chris Kucharik)

Kucharik, C. J., E. G. Booth, S. P. Loheide III, R. Power, A. R. Rissman, J. Seifert, and M. G. Turner. 2023. Building food-energy-water resilience requires avoiding unintended consequences for ecosystems. *Frontiers in Ecology and the Environment* 21(5):234-243.

November 27 – No class, Happy Thanksgiving!

(13) December 4 - Riding the roller coaster – the fun and the fear

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

Gaudet, A. D. 2015 [Secrets to thriving in graduate school](#). *Science*.

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

Cherry, K. 2023. Self-efficacy and why believing in yourself matters. Very well mind (blog post).

Soga, M. and K. J. Gaston. 2025. Extinction of experience among ecologists. *TREE* 40:212-215.

Some additional short commentaries:

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

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

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

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

Thriving in Graduate School (UW-Madison web site):

<https://gradlife.wisc.edu/thriving-in-graduate-school/>