

Conservation and Climate Change

Time: TBD with pairs
Location: Environmental Center Room 217
Instructor: Professor Laura Martin
Email: LJM4@williams.edu



Photo by Lee Wagner, 2017

Course Description

What does climate change mean for the future of Earth's 8.7 million-or-so species? This tutorial introduces students to an emerging literature on how climate change alters the distributions, behaviors, and interactions of plant and animal species. In it we will pay close attention to how to read a scientific paper and how to write about science from the discipline of environmental studies. Some of the questions we will consider include: How is scientific knowledge produced? What might the biotic world look like in 10, 100, and 1000 years? How are conservation and restoration practitioners responding to climate change? To what extent can local environmental management alter global trends?

Learning Outcomes

Students in this course will acquire tools for studying and explaining the ecological effects of global climate change. Students will also learn to relate ecological knowledge to environmental management practices. They will engage key questions at the intersection of ecology and science and technology studies. Finally, students will hone their written and oral argumentative skills and their abilities to respond critically to texts.

Required Texts

The course packet is available for pick-up at the Center for Environmental Studies.

Course Organization

This course is a tutorial. You and your tutorial partner will meet with me once per week in my office.

Each student will write and present orally an essay (5-7 double-spaced pages) every other week. The paper must be posted to the course website 24 hours before your tutorial session.

Every tutorial session will begin with the author reading his or her paper out loud, so that you will become more aware of the fluidity of your writing and hone your presentation skills. Be sure to read your papers out loud before the tutorial session to be sure that they work.

Every week, the student not presenting an essay will offer a critique of his or her colleague's work. The critique should be written out (2-3 double-spaced pages) and a hard copy should be given to the partner and professor when the tutorial meets. An effective critique will address substantive issues of analysis and argumentation in the partner's paper.

You'll alternate roles throughout the rest of the semester, and by the end of the semester, you'll each have written five tutorial papers and five critiques.

Writing Conventions

- Use direct quotes only when necessary (see quotation handout)
- Always include your name, date, and assignment prompt
- Number pages
- Double spaced, Times New Roman size 12
- Use Chicago style for citations

Importance of Flexibility

While I will largely hew to the syllabus, I might make changes to reading assignments as our discussion evolves. I promise not to significantly increase your load and to give you advance notice when I do change assignments.

I may also decide to rotate tutorial pairs, or I may not. If I do, please do not read into that change anything more than that I'm curious to see what happens with different pairings.

Assessment

Students will be assessed based on the quality of their written work and oral presentations, intellectual engagement, and improvement over the course of the semester.

I will not assign individual grades on tutorial papers or critiques, but I'm always available to talk about your progress and participation. If I see any problems arising that I think we need to discuss, I will be in touch with you.

Late papers, lack of preparation for class sessions, and absences are not acceptable in a tutorial. Failure to hand in a paper or critique one week may be grounds for failure in the course; failure to do so twice will result in failure in the course.

The course grading system coincides with the Williams College system of grades, where A=excellent; B=good; C=fair; D=passing; and E=failing. Note that the grades I assign represent my evaluation of the work you turn in. They in no way indicate my opinion of you as a person or the views you hold and share.

Office Hours

To sign up to visit office hours, please email me. Come to office hours with questions about writing, readings, the environmental studies program, or just to chat.

Policies

Honor Code

I strongly encourage you to re-acquaint yourself with the college Honor Code (<http://sites.williams.edu/honor-system/>). Williams takes charges of cheating and plagiarism very seriously, and either can result in your dismissal. Cheating is taking advantage of the work of others. Plagiarism is representing the work of others as your own without giving appropriate credit. If you are uncertain how the Honor Code applies to your work in this course—or if you are unsure how to distinguish between legitimate collaboration with your colleagues and academic dishonesty—please ask me.

Classroom behavior

Unless you make special arrangements with me at the beginning of the semester, laptops are not allowed in class. Cell phones must be in airplane mode (not vibrate) and put away.

The Williams community embraces diversity of age, background, beliefs, ethnicity, gender, gender identity, gender expression, national origin, religious affiliation, sexual orientation, and other visible and non visible categories. I expect that all students contribute to a respectful, welcoming and inclusive environment. If you have any concerns about classroom climate, please come to me to share your concern.

Resources

Students with disabilities of any kind who may need accommodations for this course are encouraged to contact Dr. GL Wallace (Director of Accessible Education) at 413-597-4672.

Students experiencing mental or physical health challenges that are significantly affecting their academic work or well-being are encouraged to contact me and to speak with a dean. The deans can be reached at 413-597-4171.

As a Williams student, you can use the free tutoring services provided by the Peer Academic Support network. Step-by-step instructions for scheduling tutoring sessions are on the Peer Tutoring Program webpage (<http://academic-resources.williams.edu/peer-tutor-program/>).

The Writing Workshop (<http://writing-programs.williams.edu/writing-workshop/>) is available to all students free of charge. Drop in sessions are located in the foyer of Stetson-Sawyer library. You can also schedule hour-long appointments through the online scheduler.

Hale Polebaum-Freeman is the library liaison for environmental studies and is also available to provide guidance. They can be reached at hop1@williams.edu.

Schedule

Week of 09/09

Introductory Meeting

No essay due: prepare discussion notes. Do you agree with Franzen's arguments? Select a passage that you would like to discuss. What challenges for conservation might climate change present?

- Jonathan Franzen, "Carbon Capture: Has Climate Change Made It Harder for People to Care About Conservation?" *The New Yorker*, 6 April 2015.
- Intergovernmental Panel on Climate Change, *IPCC Fifth Assessment Report: Synthesis Report Summary for Policymakers*.

Week of 09/16

Extinction

How do Kolbert (2006) and Thomas et al (2004) differ in intended audience, structure, and style? How does Kolbert describe the work of Thomas et al. (2004)? On page 168 Kolbert mentions that subsequent papers have contested Thomas et al. (2004)'s estimate of the extinction risk posed by global warming. Find one of these papers. What do the authors conclude? How do their methods differ from those of Thomas et al.?

- Elizabeth Kolbert, "The Forest and the Trees," in *The Sixth Extinction: An Unnatural History* (Henry Holt, 2014) :148-172.
- Chris Thomas et al., "Extinction Risk from Climate Change," *Nature* 427 (2004): 145-148.

Week of 09/23

Extinction

How do Cahill et al. (2002) and Franks et al. (2007) differ in intended audience, structure, and style? How do each of these papers change or challenge the conclusions you had arrived at based on last week's reading, response paper, and discussion?

- Abigail Cahill, Matthew Aiello-Lammens, M. Caitlin Fisher-Reid, et al., "How Does Climate Change Cause Extinction?" *Proceedings of the Royal Society B* 280 (2013): 20121890.
- Steven Franks, Sheina Sim, and Arthur Weis, "Rapid Evolution of Flowering Time by an Annual Plant in Response to a Climate Fluctuation," *PNAS* 104 (2007): 1278-1282.

Week of 09/30
Range Shifts

Assignment: Write a piece for a popular audience on this topic

- Camille Parmesan, “Biotic Response: Range and Abundance Changes,” in *Climate Change and Biodiversity* (Yale University Press, 2005): 41-55.
- Craig Moritz *et al.*, “Impact of a Century of Climate Change on Small-Mammal Communities in Yosemite National Park, USA,” *Science* 322 (2008): 261-264.

Week of 10/07
Phenological Shifts

Assignment: Write a piece for a popular audience on this topic

Required talk: Tuesday 10/08, Dr. Kim Cobb Georgia Tech, “Corals, climate change and the future,” details TBA

- Terry Root and Lesley Hughes, “Present and Future Phenological Changes in Wild Plants and Animals,” in *Climate Change and Biodiversity* (Yale University Press, 2005): 61-69.
- Jane Memmott *et al.*, “Global Warming and the Disruption of Plant-Pollinator Interactions,” *Ecology Letters* 10 (2007): 710-717.

Week of 10/14
Food Security, Biodiversity, and Climate Change

- Ben Phalan, Malvika Onial, Andrew Balmford, and Rhys Green, “Reconciling Food Production and Biodiversity Conservation: Land Sharing and Land Sparing Compared,” *Science* 333 (2011): 1289-1291.
- Camila Donatti, *et al.*, “Vulnerability of Smallholder Farmers to Climate Change in Central America and Mexico: Current Knowledge and Research Gaps,” *Climate and Development* 11 (2019): 264-286.
- Chittaranjan Kole *et al.*, “Application of Genomics-Assisted Breeding for Generation of Climate Resilient Crops: Progress and Prospects,” *Frontiers in Plant Science* 11 (2015): 10.3389/fpls.2015.00563.

Week of 10/21
Rethinking Protected Areas

- Clinton Jenkins and Lucas Joppa, “Expansion of the Global Terrestrial Protected Areas System,” *Biological Conservation* 142 (2009): 2166-2174.
- Lee Hannah *et al.*, “Protected Area Needs in a Changing Climate,” *Frontiers in Ecology and the Environment* 5 (2007): 131-138.
- Lauren Sommer, “Planning for the Future of a Park Where the Trees Have One Name,” NPR, 2 August 2016

Week of 10/28
Novel Ecosystems

- Richard Hobbs, Eric Higgs, and James Harris, “Novel Ecosystems: Implications for Conservation and Restoration,” *Trends in Ecology and Evolution* 24 (2009): 599-605.
- Carolina Murcia *et al.*, “A Critique of the ‘Novel Ecosystem’ Concept,” *Trends in Ecology and Evolution* 29 (2014): 548-553.

Week of 11/04
Managed Relocation

- Emma Marris, “Radical Rewilding” and “Assisted Migration,” in *The Rambunctious Garden: Saving Nature in a Post-wild World* (Bloomsbury, 2011): 57-97.
- Mark Schwartz *et al.*, “Managed Relocation: Integrating the Scientific, Regulatory, and Ethical Challenges,” *BioScience* 62 (2012): 732-743.
- John Kostyack, Joshua Lawler, Dale Goble, Julian Olden, and J. Michael Scott, “Beyond Reserves and Corridors: Policy Solutions to Facilitate the Movement of Plants and Animals in a Changing Climate,” *BioScience* 61 (2011): 713-719.

Week of 11/11
Carbon Removal and Conservation

- Holly Jean Buck, “The Need for Carbon Removal,” *Jacobin Magazine* 12/11/2018.
- Bronson Griscom *et al.*, “Natural Climate Solutions,” *PNAS* 114 (2017): 11645-11650.

Week of 11/18

Carbon Removal and Conservation

- Christopher Trisos *et al.*, “Potentially Dangerous Consequences for Biodiversity of Solar Engineering Implementation and Termination,” *Nature Ecology & Evolution* 2 (2018): 475-482.
- David Lindenmayer *et al.*, “Avoiding Bio-perversity from Carbon Sequestration Solutions,” *Conservation Letters* 5 (2012): 28-36.

Week of 11/25

No meeting – Thanksgiving Break

Week of 12/02

The Scale of Solutions

No essay due; final essay revisions due.

- Juan Patino-Martinez *et al.*, “A Potential Tool to Mitigate the Impacts of Climate Change to the Caribbean Leatherback Sea Turtle,” *Global Change Biology* 18 (2012): 401-411.
- T.P. Hughes, A.H. Baird, D.R. Bellwood, *et al.*, “Climate Change, Human Impacts, and the Resilience of Coral Reefs,” *Science* 301 (2003): 929-933.

