

## 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

Cell phones must be in airplane mode and put away before class begins (vibrate doesn't count).

The classroom is a place for vigorous, thoughtful, and respectful debate. If at any time you feel limited in your ability to express your ideas openly, please let me know immediately.

## **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. The Writing Workshop also offers a Writing Partner service to support students who may need more attention and guidance than can be provided within a regular Writing Workshop session.

Christine Ménard is the library liaison for environmental studies and is also available to provide guidance. She can be reached at [cmenard@williams.edu](mailto:cmenard@williams.edu).

## Schedule

### Week of 09/09

#### Introductory Meeting (entire class)

*No essay due: prepare discussion notes. Do you agree with Franzen's arguments? Select a passage that you would like to discuss. How do Kolbert (2006) and Parmesan et al. (1999) differ in intended audience, structure, and style? How does Kolbert describe the work of Parmesan et al.? 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.
- Elizabeth Kolbert, "The Butterfly and the Toad," in *Field Notes from a Catastrophe* (Bloomsbury, 2006):67-90.
- Camille Parmesan, Nils Ryrholm, Constanti Stefanescu, Jane Hill, Chris Thomas, *et al.*, "Poleward Shifts in Geographical Ranges of Butterfly Species Associated with Regional Warming," *Nature* 399 (1999): 579-583.

### Week of 09/16

#### Extinction

- Elizabeth Kolbert, "The Forest and the Trees," in *The Sixth Extinction: An Unnatural History* (Henry Holt, 2014) :148-172.
- Mark Urban, "Accelerating Extinction Risk from Climate Change," *Science* 384 (2015): 571-573.
- Abigail Cahill, Matthew Aiello-Lammens, M. Caitlin Fisher-Reid, *et al.*, "How Does Climate Change Cause Extinction?" *Proceedings of the Royal Society B* (2012): 10p.

### Week of 09/23

#### Creation

- Ferris Jabr, "The Case that Humans are Creating New Species Despite Killing Off So Many," *Vox*, 15 December 2017.
- Sarah Diamond, Lacy Chick, Abe Perez, *et al.*, "Rapid Evolution of Ant Thermal Tolerance across an Urban-Rural Temperature Cline," *Biological Journal of the Linnean Society* 121 (2017): 248-257.
- Laura J. Martin, Robert R. Dunn, Rachel Adams, *et al.*, "Evolution of the Indoor Biome," *Trends in Ecology and Evolution* 30 (2015): 223-232.

## **Week of 09/30**

### **Range Shifts**

- 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.
- Lauren Sommer, “Planning for the Future of a Park Where the Trees Have One Name,” NPR, 2 August 2016

## **Week of 10/07**

### **Phenological Shifts**

- 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.
- Kevin McCann, “Protecting Biostructure,” *Nature* 446 (2007): 29.

## **Week of 10/14**

### **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 10/21**

### **Novel Ecosystems**

- Bethany Bradley, Michael Oppenheimer, and David Wilcove, “Climate Change and Plant Invasions: Restoration Opportunities Ahead?” *Global Change Biology* 15 (2009): 1511-1521.
- Erle Ellis *et al.*, “Used Planet: A Global History,” *Proceedings of the National Academy of Sciences* 110 (2013): 7978-7985.

## **Week of 10/28**

### **Conservation Challenges**

*No essay due: prepare discussion notes. Skype visitors: Dr. Rachel Neugarten (Conservation International) and Dr. Susan Cook-Patton (The Nature Conservancy)*

- Nicole Heller and Erika Zavaleta, "Biodiversity Management in the Face of Climate Change: A Review of 22 Years of Recommendations," *Biological Conservation* 142 (2009): 14-32.
- Sam Pearsall, "Managing for Future Change on the Albemarle Sound," *Climate Change and Biodiversity* (Yale University Press, 2005): 359-362.

## **Week of 11/04**

### **Rethinking Protected Areas**

- Lee Hannah *et al.*, "Protected Area Needs in a Changing Climate," *Frontiers in Ecology and the Environment* 5 (2007): 131-138.
- Mark Anderson and Charles Ferree, "Conserving the Stage: Climate Change and the Geophysical Underpinnings of Species Diversity," *PLoS ONE* 5 (2010): e11554.
- Meade Krosby, Joshua Tewksbury, Nick Haddad, and Jonathan Hoekstra, "Ecological Connectivity for a Changing Climate," *Conservation Biology* 24 (2010): 1686-1689.

## **Week of 11/11**

### **Managed Relocation**

- Mark Schwartz *et al.*, "Managed Relocation: Integrating the Scientific, Regulatory, and Ethical Challenges," *BioScience* 62 (2012): 732-743.
- Emma Marris, "Radical Rewilding" and "Assisted Migration," in *The Rambunctious Garden: Saving Nature in a Post-wild World* (Bloomsbury, 2011): 57-97.
- 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 11/18**

No meetings – Thanksgiving break

**Week of 11/25**

**The Scale of Solutions**

- 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.

**Week of 12/02**

**Balancing Carbon and Conservation**

- Michael Huston and Gregg Marland, “Carbon Management and Biodiversity,” *Journal of Environmental Management* 67 (2003): 77-86.
- Anne Larson, “Forest Tenure Reform in the Age of Climate Change: Lessons from REDD+,” *Global Environmental Change* 21 (2011): 540-549.

**Week of 12/09**

**Conclusions** (entire class)

