Biodiversity Conservation in a Rapidly Changing World

BI197, January 2020

Professor: Dr. Colin Donihue
Email: cmdonihu@colby.edu
Class Time: M, T, Th 9:00 – 12:00
Drop-in hours: Arrange by email
Room: Olin 19B except week 2 (see below)

Course description:

Humans are changing landscapes at an unprecedented pace with cascading consequences for ecosystems. How do scientists measure what has been lost and decide how to protect what remains? This course explores topics in human land-use, biodiversity conservation, rapid evolution, and extinction in the Anthropocene. Using museum specimens of extinct lizard populations as a case study, we will discuss the value of museum collections, the tradeoffs between species conservation and human development, and future avenues for biodiversity conservation. Through lectures, hands-on lab work, and reading both scientific and popular-press articles, students will learn about - and debate - the challenges of biodiversity conservation in a rapidly changing world.

Student learning goals:

Upon completion of this course, students will be able to:

- Critically read, evaluate, and discuss scientific literature
- Collect, analyze, and interpret original data from museum specimens

And will be broadly versed in:

- How scientists measure biodiversity
- The prevailing threats to biodiversity in the Anthropocene
- The multifaceted considerations of human development, environmental justice, and biodiversity conservation
- The future of conservation

Readings:

Many classes will have assigned readings. All readings must be completed before class on the day they are assigned. PDF copies of all of the readings will be posted on Moodle.

In addition, I have provided further background readings that are optional but will deepen your understanding of these topics. I am available to discuss any of the optional reading material.

Visiting speakers:

I have arranged virtual visits from several conservation practitioners and academics throughout the course. In preparation, I expect students to post questions for the speaker to Moodle by 8:00 PM the day before the speaker visits, and to write a "Takeaways" summary that highlights the key points of the discussion with the visiting speaker. Takeaways will be due on Moodle by the end of the day following the speaker's visit. Additional details on the format, content, and grading of the Takeaways will be given in class.

What to expect in this course:

- Attendance: I expect you to arrive on time, provide your full attention, and be actively engaged. We will explore topics not covered in readings, discuss and debate case studies, and have active group exercises. Attendance counts towards your participation grade.

- Participation: Participation is fundamental to the course. This includes coming to class prepared, actively engaging, asking questions, and contributing to a positive learning environment. It is more important that you participate than for you to be right, so please add your voice to the discussion. There will be opportunities for participation through class activities, discussions, and asking questions.

- Civility and Inclusivity: I strive to foster a welcoming and inclusive classroom community where everyone feels comfortable contributing ideas and questions. This class welcomes all people regardless of race, ethnicity, religion, gender identity, or sexual orientation. I will gladly honor your request to address you by an alternate/preferred name or gender pronoun. I expect you to respect everyone in the class, which includes making space for others to contribute and actively listening to their ideas. Infringements of civility will not be tolerated. You can report any unwelcome verbal or physical behavior to me, the Biology Department chair (Dr. Tariq Ahmad), or the Dean of Students Office.

- Technology: Multi-tasking with electronics that distract you (and your peers) from participating fully in class is prohibited and will result in a reduced participation grade. Using computers to take and refer to notes is allowed. Please refrain from using cell phones during class.

- Academic Honesty: Colby has a clear, zero-tolerance policy for academic dishonesty, including strict consequences if students present others' work as their own. I will be adhering to these guidelines. Please refer to the College catalog for the policy statement, and this library guide for avoiding plagiarism: libguides.colby.edu/avoidingplagiarism. If you have any questions, please ask.

Grading:

Your grade will be calculated from the following assignments (additional grading guidelines will be made available for each assignment in class and on Moodle):

Speaker questions	x8	40
Takeaways	x8	120
Homework assignments	x5	125
Perspective Piece		50
Final Report		100
Participation		50
	Total points possible:	485

Late assignments will not be accepted. Plan ahead for technical disasters and extracurricular activities by starting assignments early. Come see me if you have questions.

Course topic schedule:

January 6 — **Introduction to BI197; Biodiversity in the Anthropocene**
What is biodiversity and how do scientists measure biodiversity in the wild?
Guest speaker: Kara Kugelmeyer, Colby College, Science Library

January 7 — **Threats to Biodiversity**
Why do we care about biodiversity and what are the threats to biodiversity in the Anthropocene?
Guest speaker: Dr. Jennie Miller, Defenders of Wildlife

January 9 — **Dam Nation**
What are the impacts of dams on ecosystems and humans?
Guest speaker: Dr. Meredith Holgerson, St. Olaf College

January 13 — **Chehalis River Basin: Washington State** — *Class meets in Diamond 344*
Can we find compromise between stakeholders around the Chehalis River Dam?

January 14 — **The Aswan High Dam: Egypt** — *Class meets in Diamond 344*
What were the arguments for and consequences of creating the Aswan High Dam in Egypt? How do we measure museum specimens?
Guest speaker: Greg Watkins-Colwell, Yale University, Peabody Museum

January 16 — ***Chalcides ocellatus*** — *Class meets in Arey 207*
Lab work: Measuring extinct populations of *C. ocellatus* from Egypt.

January 20 — **Analyzing Data in R**
How do we analyze and visualize data using R?
Guest speaker: Lauren Augustine, St. Louis Zoo

January 21 — **Using Museums for Conservation**
Debate: Conservation costs and benefits for collecting biological specimens.

January 23 — **Harvard Museum of Natural History**
Class trip to the collections of the Harvard University Natural History Museum.

January 27 — **Conservation in a Changing World**
How do human-dominated landscapes and climate disruption affect modern conservation?
Guest speaker: Dr. Max Lambert, U.C. Berkeley

January 28 — **Conservation in Action**
How is conservation done today? Considering stakeholders and policy makers for conservation action.
Guest speaker: Dr. Alex Moore, American Museum of Natural History
Guest speaker: Lia Morris, Colby College, DavisConnects

January 30 — **Biodiversity Conservation in the Anthropocene**
Debate: The future of biodiversity conservation in the Anthropocene.
Guest speaker: Shanna Challenger: Fauna and Flora International