



AEC 761 Conservation and Climate Science
Lecture Tuesday and Thursday 1:30 to 2:45 pm, DCL 123

Instructors:

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Class Website: <https://wolfware.ncsu.edu/>

Office hours: TBA, **office hours are also available by appointment**

The class will focus on the concepts and theories in ecology that have the greatest potential for conserving biological diversity in a changing climate. The recurrent question will be: how can we apply ecology to improve conservation of species and biodiversity as climate changes? There are obvious solutions to most conservation problems that ultimately stem from rapid human population growth and associated habitat destruction. In our class, we will focus on those issues but more extensively on identifying creative applications of ecology and climate science that will mitigate human impacts on biodiversity in a world in which climate is changing.

We strongly recommend that students have a text as a reference to provide a common core of knowledge. The recommend test is *Conservation Science: Balancing the Needs of People and Nature* by Peter Kareiva and Michelle Marvier. You can rent or buy (approx. \$20 or \$62, respectively) this text from Amazon here is the link: https://www.amazon.com/Conservation-Science-Balancing-People-Nature/dp/1936221497/ref=sr_1_1?ie=UTF8&qid=1500383921&sr=8-1&keywords=peter+kareiva

Learning outcomes of the course

- **Recognize & Describe** the principles of ecology and biology as they apply to conservation of biological diversity and ecosystem services in a changing climate
- **Describe & Discuss** tools and new scientific advances in conservation science and climate change science
- **Apply** graphical, quantitative, and first principles to explain conservation responses to climate change
- **Analyze** primary research in conservation science and climate change science
- **Demonstrate** acquired skills in writing & oral presentations, particularly through discussion-based aspects of this course
- **Learning outcome for Students:** Fluency in a survey of topics in conservation science and climate change science that will permit students to engage in other graduate courses, and in their professional interactions.

Grading

I. Participation, 50%.

This will include your participation in class discussions, your contribution to web-based discussions, and your performance in leading your specific discussion (which includes break-out and bigger discussions in class, and moderating online forum).

II. Midterm Exam, 25%

III. Final presentation, 25%

You will present your research (dissertation or thesis research; could be proposed research) that must connect to conservation in a changing climate. The presentation will be in video format. This will be an introduction to video-making. It will involve several steps:

Final product: due week of November 28th in class.

- A complete draft of a 2-4 minute video explaining your research and its importance to the audience of the SE CSC. Video should include narration or dialogue by the student (either on or off screen), and can consist of still or moving images. Creativity is encouraged!
- DUE October 31st. Complete a storyboard/script of content that will be included. Should be between 1-3 pages. Jason will provide a template.
- Attend two Digital Media Production workshops through the libraries for access to and training for production equipment (<https://www.lib.ncsu.edu/events/classes/digital-media-production>).

I suggest orientation, video production, and audio production. More ideas to follow. Jason Evans Groth jevansg@ncsu.edu is a great contact at the library.

The course uses Standard NCSU Letter Grading:

98 ≤A+ ≤ 100	73 ≤C < 77
93 ≤A < 98	70 ≤C- < 73

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90 ≤ A- < 93	67 ≤ D+ < 70
87 ≤ B+ < 90	63 ≤ D < 67
83 ≤ B < 87	60 ≤ D- < 63
80 ≤ B- < 83	0 ≤ F < 60
77 ≤ C+ < 80	

Expectations & Policies

The student is responsible for being aware of and turning in all assignments on the given dates. The syllabus and on the moodle website has further information on each assignment.

Attendance

- You are required to be in class and on time.

Assignments

- See details on assignments below.

Integrity

- All course work submitted for a grade in both lecture and field part must be your own. University standards of academic integrity forbid either giving or receiving unauthorized help on graded work. Violations of University standards will be prosecuted. You will need to sign the academic integrity statement on each written assignment. Please read the **Code of Student Conduct** (POL 11.35.01) found at <http://policies.ncsu.edu/policy/pol-11-35-01> and go to the **Office of Student Conduct** at: <http://studentconduct.ncsu.edu/>
- Try not to pack up before lecture ends. This is disruptive to others. You will be allowed to leave for your next class or meeting in a timely manner.
- Try your best to leave your sitting area clean and tidy by picking up any trash that's yours.
- Turn off completely all electronic devices (iPods, cell phones, laptops) during lecture, unless you are using them to read lecture notes, or take notes.
- Remember that this course is for you—you will get as much out of it as you're willing to put in.
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Email Etiquette

Make sure to include your full name in the body of all emails you send to me. If you're replying to an email, please include any previous exchanges in the email reply. All emails should begin with a salutation and close with your name.

Statement on Disabilities: If you have a disability that will affect your performance in this course, reasonable accommodations will be made for you. You must provide documentation of your disability from the NCSU Disability Student Services, 2000 Harris Hall, 515-7653. For more information on NC State's policy on working with students with disabilities, please see the **Academic Accommodations for Students with Disabilities Regulation** (REG 02.20.1) at <http://policies.ncsu.edu/regulation/reg-02-20-01> and **Disability Services Office** at <http://www.ncsu.edu/dso/>. Also, please be sure to discuss any issues with me.

Non-discrimination Policy: NC State University provides equality of opportunity in education and employment for all students and employees. Accordingly, NC State affirms its commitment to

maintain a work environment for all employees and an academic environment for all students that is free from all forms of discrimination. Discrimination based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation is a violation of state and federal law and/or NC State University policy and will not be tolerated. Harassment of any person (either in the form of quid pro quo or creation of a hostile environment) based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation also is a violation of state and federal law and/or NC State University policy and will not be tolerated. Retaliation against any person who complains about discrimination is also prohibited. NC State's policies and regulations covering discrimination, harassment, and retaliation (POL 04.25.05) may be accessed at <http://policies.ncsu.edu/policy/pol-04-25-05> and <http://oied.ncsu.edu/oied/policies.php>. Any person who feels that he or she has been the subject of prohibited discrimination, harassment, or retaliation should contact the **Office for Equal Opportunity** (OEO) at 919-515-9617.

Syllabus

Date(s)	Topic
Aug. 17	The ecology of conservation – Martha
Aug. 22	Climate science background: <i>Part 1: Energy, heat, and the greenhouse effect</i> – Adam
Aug 24	Climate science background: <i>Part 1: Energy, heat, and the greenhouse effect</i> – Adam / Digital Library Resources - Jason
Aug 29	Conservation Priorities (ESA and Hotspots)- Martha
Aug 31	Conservation Priorities (ESA & Hotspots) Discussion _____
Sep. 5	Climate Change & Demography – <i>small population dynamics</i> - Martha
Sep 7	Climate Change & Demography Discussion _____
Sep. 12	Climate Change & Phenology, Rapid Evolution – <i>phenology, phenotypic plasticity, local adaptation</i> – Martha
Sep 14	Climate change & Phenology, Rapid Evolution Talks: Martha, Erica, Ryann
Sep. 19	Climate science background: <i>Part 2: Climate system feedbacks</i> - Adam
Sep 21	Climate science background: <i>Part 2: Climate system feedbacks</i> - Adam
Sep. 26	Climate Models: <i>Part 1: Global climate models</i> – Ryan Boyles
Sep 28	Climate Models: <i>Part 2: Downscaling and applications</i> – Ryan Boyles
Oct. 3	Midterm
Oct 5	<i>Fall Break No Class</i>
Oct. 10	Restoration ecology, adaptive management
Oct 12	Restoration ecology, adaptive management Discussion _____
Oct. 17	Making a research video – Jason / Climate Change and Biodiversity – Martha
Oct 19	Climate Change & Biodiversity Discussion _____
Oct. 24	Terrestrial reserve design
Oct 26	Terrestrial reserve design Discussion _____
Oct. 31	TNC Peat & Carbon Sequestration - Chuck Peoples, TNC
Nov 2	Climate related Talks: Jess, Michael, & TBA
Nov. 7	Ecosystem Services– Lydia Olander, Duke University (<i>Martha at Ento Soc</i>)
Nov 9	Ecosystem Services Discussion _____
Nov. 14	Marine reserve design
Nov 16	Marine reserve Discussion _____
Nov. 21	Conservation Genetics & Climate Change or Climate change and the human population - <i>Martha</i>
Nov. 28, 30	Presentations

Organization:

I have organized the schedule to focus on one topic per week for the most part. Each week, Tuesday’s class will emphasize lecture by Dr. Reiskind, Dr. Terando, or a guest. Thursday’s class will include less emphasis on lecture and lots of opportunity for discussion. Papers will be assigned at least one week before discussion. The papers will be either readings from a book, classic papers conservation biology and climate science, or case studies in conservation and/or climate science. Required readings will be available through a link at the Moodle page. From off campus, most online articles can be obtained only after logging in to your unity account. The discussions in class will be preceded by web-based discussions that are described at the end of this handout.

Discussions will be led by students, and each student will be responsible for leading one discussion. For your discussion, you will be required to meet with Dr. Reiskind twice: once at least a week before your discussion to choose papers, and once the Wednesday before the discussion to outline focal topics for class. During the week of your discussion, you will also have the opportunity to direct online discussion on Moodle.

A few of the discussion days are actual quick talks from either graduate students or researchers about their research. We will post companion papers to these talks and the short 10 minutes talks will follow with discussion. For those days there will be 3 to 4 10 minute talks.

Details on Assignments

Directions for Web-based Discussions

Discussion Days

Discussions in class will be preceded by a web-based discussion. The purpose of the web-based discussion is to make sure that all papers are read and thought through in advance, to provide a forum for discussion topics that may go beyond in-class topics, and to provide a basis for in-class discussion. The web-based discussion can be accessed at <https://wolfware.ncsu.edu/> The course should automatically be setup under your account in Moodle, you just need to log into your account.

You should then see the topic for the week (the first week's topic is called 'Week 1 Forum'). Each week, there will be a new topic. To post a new message (for example, to add your question about a paper or papers) then click on 'Add a new discussion topic.' To reply to another student's question, then click on that topic before clicking reply.

*** Please let me know immediately if you have any difficulties using Moodle *****

Those weeks that have assigned readings, every student in the class will be responsible for posting one question on our class forum. This will involve 1) a 1-2 sentence summary of an interesting point that you identified in the paper (which does not have to be the most important point), 2) a 1-2 sentence original thought stimulated by part 1, 3) given parts 1 and 2, pose a clear, concise question about the paper. ***Please follow this approach to posting a question; don't write long, rambling posts, as it will discourage other students from reading them.*** I recommend that you not view other student's questions before you post your own, as I will not accept duplicate questions. Questions will be due before class on Tuesday. You will then be required to answer one of the questions posed by another student in the class. In addition, no more than 2 answers will be accepted for any question. Your answer is due before class on Thursday. In the first few weeks of class, I will provide feedback by email if I think you could improve your postings.

Talk Days

We have talk days that are will also have a web-based discussion associated with those days. However, you will post your reflection after the talk days. Each student will be responsible for posting one reflection on our class forum related to the talk days. Follow the details above on how to generate your reflection. In addition, each student will be required to comment on one reflection posed. To avoid having to do this for two discussions at the same time. I recommend that you generate your reflection shortly after the talk day.

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NOTE: Because I know we all have stressful times during the semester or times that you have to miss for whatever reason, each student will be allowed to take a pass on 1 week of Moodle discussions of their choosing. I keep track of postings, so there is no need to contact me about the week you miss.