

Global Change Ecology, Impacts and Mitigation

BZ 353/NR 353

Tuesday/Thursday 9:30-10:45

Location: Gifford 113 (first day only)

Natural Resources 201 (all subsequent days)

Instructors:

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Overview

Humans are altering global ecosystems and causing environmental phenomena that are collectively referred to as Global Change. Advanced Biology, Natural Resource and other interested students have an opportunity to ascend in their level of cognition about the role of ecological processes in Global Change. They will also apply this knowledge toward understanding the impacts of global change on natural and human-dominated systems, and how these impacts can be mitigated.

Objectives

1. Students will develop a broad knowledge of global change ecology, its impacts on natural and human-dominated systems and some of the mitigation strategies that have been proposed.
2. Students will study the ecological mechanisms underlying a number of these global change phenomena, their impacts on ecosystems, and mitigation strategies in order to develop their comprehension of how the phenomena arise and how their impacts may be lessened.
3. Through in-class, small group and homework assignments, students will apply their knowledge to analyze case studies. These case studies will include both basic science and applications where solutions or remedies to global change issues have been proposed and/or implemented.
4. Working individually, students will conduct their own synthesis and evaluation of a specific area of global change ecology, distilling their analysis into a short research proposal (e.g., NSF pre-doctoral proposal), or a management plan. These essays will be evaluated and returned to students with the opportunity to improve their writing through revision cycles.

Format and Evaluation

This 3 credit course will meet twice weekly and will consist of lectures and in-class active-learning exercises. Lectures will be based on readings from the required text and from the primary literature. Students are expected to do the readings before class and to be prepared to

discuss them; there will be periodic surprise quizzes on the readings. The active learning exercises will include discussions, debates, role-playing exercises, and/or short in-class written exercises.

Grades will be based on in-class participation (10%), homework exercises (30%), two mid-term exams (total = 30%) and a research paper, taking the form of an NSF pre-doctoral fellowship proposal or a management plan (30%). Details of the grading for this final paper will be presented later in the semester. There will be no extra credit unless except for opportunities presented in class. Final grades will be distributed according to:

A = 90% to 100%

B = 80% to 90%

C = 70% to 80%

D = 60% to 70%

F = below 60%

Plus/minus grades will be assigned within these intervals.

The exams are scheduled for February 19 and April 2. There will be no make-up exam. Homework assignments are due at class time on the due date. Late homework assignments will not be accepted. There will be no opportunity to make up points for missed class periods.

Course Materials

Readings will be assigned and available on RamCT

RamCT

Course information, assignments, grades, readings and other important information will be posted on the course RamCT page. It is your responsibility to check this before every class for course announcements. It will be updated on a regular basis. Also, feel free to post your comments about the course and course material on the discussion forum.

Educational Philosophy

Our role in the learning process is to present material to you in an interesting and understandable manner. We will work hard to do this and to help you achieve the objectives listed in this syllabus. We expect you to attend all classes, to actively participate in class, to do all assignments on time, and to regularly check the course RamCT site.

Classroom Environment and Etiquette

It is very important that you be courteous and respectful to us, the other students, and our guest lecturers. To do so, you must be prompt for class, turn off your cell phones, and not speak when others are speaking. Feel free to ask questions in and out of class. Also, feel free to provide feedback to us on class materials, assignments and readings throughout the semester.

We expect that students will adhere to the CSU principles of academic integrity (refer to <http://www.catalog.colostate.edu/front/policies.aspx>). Failure to do so may result in a zero for an assignment or a failure of the class.

Plagiarism

Given that written assignments will be a major feature of this class, we would like students to be particularly careful about plagiarism. Every idea that you turn in should be your own work, or it should be clearly acknowledged. Work that shows signs of plagiarism will be given a zero; more serious acts may lead to failure of the course. Learn more about plagiarism at www.plagiarism.org.

Talk to us

If you do not understand something we present in class, please let us know – chances are someone else also does not understand. We welcome all questions regarding the course material, assignments!

If you experience disabilities that affect your learning, please let us know how we can best accommodate you.

Tentative Lecture Schedule and Assignment Due Dates

Date		Assignment
	Resources, population	
19-Jan	Resources and the global commons	
21	Human population, energy, patterns of consumption & emissions	
26	Writing assignment due, discussion	HW1
	<i>Climate change: underlying mechanisms</i>	
28	Understanding climate change	
2-Feb	Global carbon cycle I	
4	Global carbon cycle II	
9	David Randall: Modeling climate change & IPCC process	
11	Global ecology of CH ₄ and N ₂ O	HW2
16	Our future climate: global and regional predictions	
18	EXAM 1	
	<i>Impacts of climate change on ecosystems and resources</i>	
23	Diversity, extinction, species ranges, fragmentation	
25	Impacts on forest ecosystems and the forestry sector	
2-Mar	Impacts on grasslands and tundra	
4	Ellen Wohl: Climate change and water resources	
9	Resilience of ecosystems to change & how to do lit search	
11	Case study: subsistence societies	
	Spring Break	
23	Climate change and disease ecology	Topic description
25	Jill Baron: Case study: management of US Parks	
30	Case study: the US ski & wine industries	HW3
1-Apr	EXAM 2	
	<i>Mitigation strategies for climate change</i>	
6	Rich Conant: Carbon sequestration in soils	
8	Mitigation: biofuels	Bibliography
13	Mitigation: forestry & agriculture	
15	Mitigation: the rest of the portfolio	
20	In-class project on mitigation (Wedges)	
22	Susan Innis: Policy of mitigation	
	<i>Other Global Change Phenomena</i>	
27	Ruth Hufbauer: Biological invasions	
29	Case study: coral reef biology	
4-May	Nitrogen & ozone pollution	
6	Wrap-up discussion	Final Paper