

Biol 490: Global Change ecology Tentative Syllabus 01/04/10

Instructor: Professor Lauren Buckley (buckley at bio.unc.edu)

Meeting Time and Place: TR 11:00 - 12:15, New East 301

Prerequisites: BIOL 201 or permission of instructor

Office hours (Tentative): Wednesdays 3-5 in Wilson 340

Graduate Research Consultant: Heidi MacLean (hmaclean at email.unc.edu, Wilson 342)

READING

Articles and chapters are assigned and distributed on the wiki (<http://www.unc.edu/~lbuckley/GCE/pmwiki.php>, password:GCE490). Check the wiki frequently for potential changes in reading assignments. Come to each class prepared to discuss the "Assigned Reading". The "Additional Reading" is optional and designed to provide helpful background or extensions for the topic.

The following text is an optional supplement to the assigned readings. Used copies can be purchased online inexpensively. The book has also been placed on reserve in the undergraduate library. The class is structured similarly to the book, so the book may afford helpful background reading: Graves and Reavey. 1997. Global Environmental Change: Plants, Animals and Communities.

ACTIVITIES

Courses meetings will consist of approximately 2/3rds lectures (Lec on schedule) and 1/3 activities. There will be three types of activities:

Discussions (Dis)- We will discuss the motivations, methods, results, and implications of recent papers. Before each discussion, you should submit two (thoughtful but brief) comments or questions to the discussion page of the wiki.

Debates (Deb)- We will debate topics of current interest in global change ecology. Key background reading will be assigned. Students will sign up on the Blackboard wiki (by 9AM Wednesday for a Thursday debate and 9AM Monday for a Tuesday debate) for one of two specified debating positions. If the number of people selecting each position is unbalanced, I will randomly reassign people by noon on the day sign ups are due. Before each debate, you should submit two (thoughtful but brief) comments or questions to the discussion page of the wiki.

Exercises (Ex)- These are activities designed to provide hands-on experience with the methods of global change research. Following exercises 1 and 3-6 exercises (specified below and in the schedule) you will be required to hand in a brief typed report including figures if appropriate. These do not need to be polished reports, but should clearly and articulately convey your findings from the exercise. Each question should be answered with one to several complete sentences. Additionally hand in data where relevant. The reports will be graded according to

whether the exercises were correctly and thoroughly completed and whether answers to questions demonstrate comprehension of the exercise's focal points.

- Ex 1: Vostok Ice Core- We will analyze data from the Vostok Ice Core.
- Ex 2: FACE site visit- We will have a researcher visit us from the FACE (Free Air Carbon Enrichment) site in Duke Forest.
- Ex 3: Carbon auction- We will conduct several types of carbon markets in class. ~1/2 of class members will be assigned to serve as the CEOs of various carbon-intensive industries. You will be assigned a type of industry, a current level of carbon emission, and an emission reduction target. You should come to class with plans (including cost and volume) for several emission reduction strategies. ~1/2 of class members will be assigned to serve as the CEOs of carbon offset companies. You should come to class with plans for selling carbon offsets or sequestration. Several class members will be assigned to serve on a regulatory board. You should come to class with rough estimates (costs and volumes) for various carbon reduction, offset, or sequestration strategies.
- Ex 4: Range models- Each student will predict current and potential future distributions of a chosen species using locality data and the correlative modeling technique Maxent.
- Ex 5: Phenology- We will analyze changes in the date of first flight for California butterflies during recent climate change.
- Ex 6: Case study- Each student will select a species and investigate whether the species has already responded to climate change and how the species is likely to respond in the future. Come to class prepared to briefly present on the species' potential fate. Will the species move, acclimate, adapt, or face extinction?

ASSIGNMENTS

Additionally, there will be a midterm, final, and two assignments:

- Research proposal (3 page)- Students will formulate a research question in global change ecology and write a research proposal to address this question. The proposal will be for a [NICCR](#) (National Institute for Climate Change Research) grant (one year exploratory project with a maximum budget of 125k).
- IPCC section update (3 pages)- Students will select a section of the IPCC (Intergovernmental Panel on Climate Change) Ch4 report to update with recent research findings (from at least 5 studies).

GRADUATE RESEARCH CONSULTANT (GRC)

In this course, you will be working with a Graduate Research Consultant Heidi MacLean (hmaclean at email.unc.edu) who will assist you in the research components of the exercises and assignments. Heidi will be available during office hours to assist you with completing the exercises and the research proposal and IPCC update assignment. She will serve as a resource for the research component of the course, but will not be responsible for or provide information on grading or course logistics.

GRADING

- Midterm 15%
- Final 20%
- Research Proposal 15%
- IPCC section update 15%
- Lab exercises 20% (Exercises 1, 3-6 each 4%)
- Presentations and participation/preparedness for debates and discussions 15%

Among the final 15% of your grade listed above, the presentation of your research proposal will account for 3%. Your presentation will be graded according to whether your presentation is clearly organized, whether your research question and plan is concisely and clearly presented, whether you are well prepared and make a compelling case for your proposed research, and whether your visual aids support your proposed research. Participation and preparedness for debates and discussions will account for 12%. The following components will determine your grade: your preparedness to discuss the readings, the thoughtfulness of your comments and questions posted to the discussion page, demonstrating comprehension of the topic through asking questions and commenting during class, listening to and considering the ideas of others and responding when appropriate. Your effectiveness as a discussion or debate leader will also be assessed.

Course grades will not be curved, but the percentage point cutoffs for letters grades will be determined at the conclusion of the semester based on student performance.

Late Policy: Unless you have made arrangements with Professor Buckley prior to the due date or have a university excused absence, you will lose 10 percentage points per day on late assignments.