

GEOG 701s: Sem. in Advanced Geography-Biogeography: Climate-Change Ecology
Fall 2011, 3 credits, UNR
T/R 2:30-3:45 MS 304/222

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Objectives:

- Become familiar with basis for and predictions of climate change.
- Understand the current state of knowledge on biological responses to past, current, and future climate change.
- Gain familiarity with selected research tools/methods of climate-change ecology.
- Practice developing a research program, proposal writing, and peer-review.

Recommended preparation: Familiarity with climate systems and ecology/biogeography

Textbook: None required. Some readings provided by instructor, others student selected.

Assessment:

Climate change quiz	10%
Climate Change Ecology Science Simulator	50%
Ia. Annotated Bibliography	[5%]
Ic. State of science presentation	[15%]
II. Call for proposals	[10%]
III. First-stage proposal	[15%]
IV. Peer reviews	[5%]
Lab exercises	25%
Discussion facilitation	5%
Participation and attendance	10%

Any student with a disability needing academic adjustments or accommodations is requested to speak with me or the Disability Resource Center (Thompson Building Suite 101) as soon as possible to arrange for appropriate accommodations.

Cheating, plagiarism or otherwise obtaining grades under false pretenses constitute academic dishonesty according to the code of this university. Academic dishonesty will not be tolerated and penalties can include canceling a student's enrollment without a grade, giving an F for the course or for the assignment. For more details, see the UNR General Catalog.

Your student fees cover usage of the University Writing Center (784-6030 or http://www.unr.edu/writing_center/). You are encouraged to complement help from your instructor with help from this center.

Syllabus, [subject to modification]

Date	Topic [brackets indicate held MS 222] Otherwise MS 304. G =guest instructor, S =student-led	Notes [possible Albright absences]
30 Aug 1 Sep.	Course Intro, climate basics Natural and human sources of climate variability	
6 Sep. 8 Sep.	Past climates G : F. Biondi Global climate models [EdGCM intro] G : B. Hatchett	[US/China Workshop] Split session: lec/lab
13 Sep. 15 Sep.	Understanding GCM output [EdGCM] G : B. Hatchett Regional Climate models G : J. Mejia	Split session: lec/lab
20 Sep. 22 Sep.	Uncertainty and human dimensions Climate quiz [EdGCM exercise]	
27 Sep. 29 Sep.	Ecology and climate, research exercise intro [open lab time/EdGCM]	[APCG –many gone]
4 Oct. 6 Oct.	[EdGCM wrapup] <i>Open time to work on State of the Science exercise.</i>	[NASA Joint Science Workshop]
11 Oct. 13 Oct.	Ecology and Climate (cont'd) Physiology & behavior S	Present + paper discuss
18 Oct. 20 Oct.	Population, range dynamics, evolution S Introduction to species distribution modeling	Present + paper discuss
25 Oct. 27 Oct.	Biodiversity, community, conservation S [SDM lab intro]	Present + paper discuss
1 Nov. 3 Nov.	Ecosystem dynamics & feedbacks S [SDM work]	Present + paper discuss
8 Nov. 10 Nov.	Agro- & Social-ecological systems S [SDM work]	Present + paper discuss
15 Nov. 17 Nov.	Call for proposals announced, writing a proposal [SDM wrapup]	
22 Nov. <i>T-givin</i>	Climate and other global changes <i>Eat turkey/tofurkey</i>	
29 Nov. 1 Dec.	Heat waves/ thermal ecology TBD	
6 Dec. 8 Dec.	Plant physiological ecology/FACE G (Nowak) <i>Open time to work on proposals.</i>	[AGU week]
13 Dec. 15 Dec.	Proposals due, wrap up (sustainability, engineering) Panel review session S [TIME: 12:30-2:30]	

Learning climate-change ecology through program development and proposal solicitation, writing, and peer review.

Tom Albright, Assistant Professor, Department of Geography, UNR

Background. A Manhattan Project-style effort has been initiated in the US to address climate change. While most of the focus is aimed at finding ways (technological and societal) to mitigate and adapt to climate change, a substantial science research component is included. In this project, you will participate in several key aspects of this research process in the ecological sciences directorate:

- a) Member of a science program management team guiding research directions.
- b) Research scientist, developing research plans following science program management leads.
- c) Member of a peer review panel.

Under outcomes, you will see whether a particular exercise is group/individual and the percent of the overall course grade it comprises [in brackets]. There are two broad goals of this set of exercises. First, it is a mechanism for you to explore climate-change ecology, its questions, techniques, and problems. Second, this will give you some insights into the process of science and help you think about your own professional development.

Part I: State of the science

First, you will choose one key science area that is related to your interests and background. You will break into groups (of 2-3) according to these interests and conduct literature-based research of your topic. From these, you will develop a presentation on the current state of the science and identify key areas where additional knowledge or understanding is needed.

Topics for this portion may include:

- individual responses (behavior, physiology) to climate change
- population, range dynamics, and evolutionary responses
- biodiversity, community dynamics, and conservation
- ecosystem dynamics and feedbacks
- agro-ecosystems and social ecological systems

Alternatives and variations on these are possible.

Outcomes. [Ia. group | 5%]: You will share an annotated bibliography of pertinent literature. In addition to full citations, annotation will provide a 2-3-sentence synopsis of the most salient points and relevance of each paper. You need not read each paper fully, but should use this as an exercise in practicing rapid extraction of information from the literature. [Ib. group | no grade]: You will also flag two exemplary primary articles that will be read and discussed by the entire class. [Ic. group | 15%]: And finally, you will present a 30 minute Powerpoint presentation summarizing the current state of knowledge in the area and critical research directions.

Part II: Call for Proposals

At this point, you will work with colleagues to prepare and issue a call for proposals in order to encourage scientists to write proposals addressing the goals for research that were collectively identified in Part I. You will reassemble into new groups such that each group has one representative from the topic areas in part I. Now that you are broadly aware of the current state of the science, your task is to identify science goals and entice the science community to address these in an effective way. You have a good degree of freedom on how to do this. For example, perhaps some of the key science areas above might be better addressed simultaneously, or perhaps subdivided. Do you want interdisciplinary projects or focused more tightly? Is an international component important? What kind of budget per project? Be creative and have fun. Further guidance and examples will be provided in class.

Outcome: [II. Group | 10%]: Series of 2-3-pp. calls for first-stage proposals (shorter preliminary proposals used for screening) that your classmates will respond to.

Part III: Responding to a proposal call

In this part, you will examine proposal calls issued from other groups (ie. Not yours!) and find one to respond to by developing a short 2-3 page first-stage proposal. Ideally, this will be based on something that interests you and is useful to your own research planning. Proposals at this stage need to be big on ideas and be credible, but because of the early stage and short size, they do not provide a great deal of technical detail. You also need to convince a review panel that you have the capability in your research team to produce good results. Make up research team (and CVs) that would be outstanding for the task. You should locate researchers (outside of UNR) and use their CVs (and you may wish to use yourself perhaps with a CV you aspire to have in 3-5 years). Does your lab need a helicopter to do its research? A social science survey team? An array of growth chambers? No problem. Say you have what you need or request it in the proposal. Again, have fun and be creative! I expect each student to produce a proposal, but you are free to compare notes, help each other, and even identify potential for synergy amongst proposal efforts.

Outcome: [III. Individual | 15%]: A 3-pp. first-stage proposal.

Part IV: Peer review

Now that everyone has written proposals, the science program teams (of parts I & II) will each review proposals written in response to their calls. You will be participating in a simulated panel review. In this case, you will have one class period to produce written notes on each proposal and evaluate them. Each proposal submitted to a panel will be reviewed by each member of the panel, which means that some people will be very familiar with that area and others will not, which is an important challenge for proposal writers.

Outcome: [IVa. Individual | 5%]: 1-p. peer review summaries for each proposal. You will review the proposals received and evaluate them in terms of originality of questions, potential to assist your program's objectives, technical merit, and broader impacts