CLIMATE CHANGE ECOLOGY (FWE 375/875 and ZOO 400)

INSTRUCTOR:
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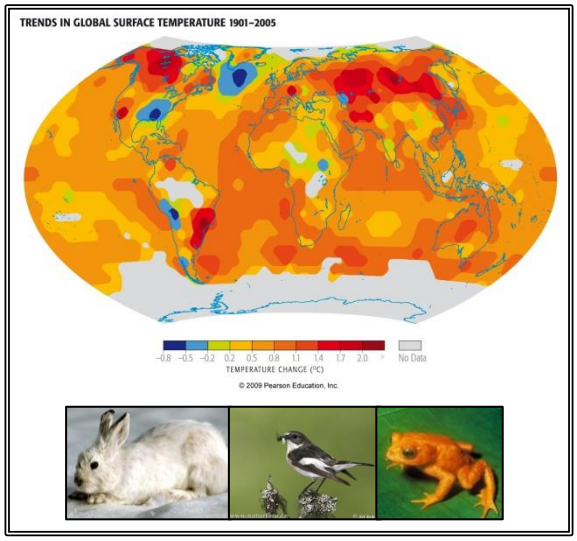
Office Hours: Tuesday and Thursdays (1:30-2:30)



LECTURES:
September 2nd, 2014 – December 11th, 2014
Tuesdays and Thursdays: 11:00 a.m. -12:15 p.m.
Russell Laboratories Room 104

COURSE PURPOSE, GOALS AND OBJECTIVES:
A relatively rapid increase in global temperatures has been documented during the past century, both across Earth's surface and in the oceans. A changing climate poses a wicked problem for conservation agencies that have the responsibility of maintaining viable populations of species and the habitats they depend on. Climate change transcends political and jurisdictional boundaries and adds significant uncertainty to the conservation and management of our natural resources. The central purpose of this class is an introduction to ecological impacts of modern climate change on species and communities. With a focus on wildlife conservation and management, the goal of this course is to provide an understanding of the direct and indirect impacts of climate change on animal and plant communities.

The course has three interconnected learning objectives for developing a comprehensive understanding of climate change ecology:

First learning objective: gain a basic understanding of the observed and predicted trends in climate within an ecological context.
Second learning objective: identify the ecological and evolutionary impacts of climate change on natural communities and wildlife populations (including changes in phenology and range limits, community dynamics, and altered trophic interactions).
Third learning objective: develop hands-on experience in developing a climate change adaptation plan that could be implemented by a local, state, or national conservation agency.

COURSE STRUCTURE AND DYNAMICS
This is an advanced course targeted to upper-level undergraduate and graduate students with a background in ecology or biology. There will be significant expectations for independent work and active in-class participation. Class grading will consist of group projects and examinations.

GRADING COMPONENTS

Group Project Report and Presentation 35%
Climate Wizard Exercises 15%
Exam I 15%*
Exam II 20%*
Group Project Progress Reports (2) 5%
Class Participation and Weekly Quizzes 10%

**Graduate students are exempt from exams*

EXAMINATIONS

There will be two exams that will consist of 10 multiple choice, 3 short answer questions, and 1 essay question. The two exams will focus primarily on the class units: *Trends and Changes* and *Ecological Impacts* (see lecture schedule).

ATTENDANCE POLICY

Attendance at all classes is mandatory. In accordance with UW-Madison policy, I will make every effort to avoid scheduling mandatory course requirements on dates when a religious observation may cause substantial numbers of students to be absent. In addition, I will extend reasonable consideration to accommodate you should your university-endorsed extracurricular activities (not including practice activities for performances or athletic events) conflict with class attendance requirements. **You must provide adequate and reasonable advance notice (>24 hrs. notice) so that I can ensure that an accommodation is made.**

You are required to be present at the beginning of the semester and to remain until the work of the semester is completed (which includes group projects and presentations). Exemptions from this must be given advanced notice from the instructor at the beginning of the course. Note that any excused or unexcused absences may have a negative impact on your final grade. It is your responsibility to be mindful of class attendance policies for each of your classes.

GROUP PROJECTS AND FINAL REPORTS

The central project of the course consists of a semester-long group exercise (groups of 3-4 students) with the goal of developing a **Climate Adaptation Plan** for a vulnerable species in Wisconsin. The core components of the plan will consist of a literature review, conceptual model, vulnerability assessment, and adaptation recommendations. The groups will give final presentations at the end of the class and complete a group final report. Peer evaluations will be done periodically throughout the course of the semester. **Full participation in the group project is mandatory and will be evaluated throughout the semester**. Note that any prolonged inability to work with your group will have a negative impact on your final grade.

LEARN@UW AND WEEKLY QUIZZES

Learn@UW will be used to post readings assignments, PowerPoint slides, and changes to the syllabus. There will be brief weekly online **quizzes** (4-5 questions) that are **mandatory**. These quizzes will be designed to gauge your level of understanding (and my ability to communicate)

the week's topics. ***You get full credit if you complete the quiz***. **Quizzes are posted every Friday by noon, and must be submitted by Monday at 12:00 p.m.**
There is a public course website at http://labs.russell.wisc.edu/zuckerberg/teaching/ but this is mainly for advertising purposes. Please do not visit this site for information on the class.

ClimateWizard
ClimateWizard (www.climatewizard.org) enables you to access leading climate change information and visualize the impacts anywhere on Earth. This web-based program allows you to choose a state or country and assess how climate has changed over time and to project what future changes are predicted to occur in a given area. You will have 2 group exercises to learn how to view and interpret historic and predicted climate maps for anywhere in the world.

Missed Lectures and Medical Absences
Campus policy with respect to flu and other contagious diseases places a premium on minimizing the risk of spreading disease. If you are running a fever over 100°F with a cough or sore throat, stay home. Wait until 24 hours after your fever breaks before returning to class**. If you miss a lecture for any reason, you are responsible for the content covered in class.** I will not respond to Learn@UW-posted queries about missed lecture content.

Students with Disabilities: Requesting Reasonable Accommodations
UW–Madison supports the right of full and equal educational opportunity for all students. Disability should not be the basis for exclusion from the institution's programs, activities and services. All students are entitled to an accessible, accommodating, supportive and nondiscriminatory institutional environment. It is therefore the policy of UW–Madison to provide reasonable accommodations to qualified students with disabilities.

Implementing reasonable and effective accommodations is a shared institutional and student responsibility. Students with disabilities who need accommodations should notify the institution of such need as early as possible, preferably before the beginning of a semester. Students who incur or recognize a disability for which an accommodation is needed during the semester should notify the institution immediately. For instructional or academic accommodations, students are encouraged to notify me directly. Students may also make accommodation requests through the McBurney Disability Resource Center or a duly designated departmental or college Access and Accommodation Resource Coordinator (AARC).

I will work with students to provide reasonable instructional or academic accommodations, although the student is responsible for self-advocacy. In addition, the McBurney Disability Resource Center is available as a resource and can assist students with accommodation issues, can recommend appropriate instructional or academic accommodations to faculty and can recommend or provide other needed reasonable accommodations.

PLAGIARISM POLICY
Academic Integrity is critical to the mission of the University of Wisconsin-Madison, a research institution with high academic standards. All members of the University community play a role

in fostering an environment in which student learning is achieved in a fair, just and honest way. **I have zero tolerance for plagiarism**. You are expected to uphold the core values of academic integrity which include honesty, trust, fairness, respect and responsibility. These core values, combined with finding one's purpose and passion and applying them in and out of classroom learning, produce students who become extraordinary citizens. This unique path of opportunities, created by each student, is commonly known as the Wisconsin Experience and impacts our campus community and beyond in significant and positive ways. The value of a University of Wisconsin degree depends on the commitment of our academic community to promote high levels of honesty and respect for the intellectual property of others.

The University of Wisconsin-Madison takes academic misconduct allegations very seriously. If I suspect a student has engaged in academic misconduct, I will contact the student and ask them to explain their work. If I still believe the student engaged in such an act after meeting with them, I will decide on a sanction (with outside consultation), which may include a zero on the assignment or exam, a lower grade in the course or failure in the course. The Dean of Student's Office will be informed and will contact the student about their rights. Repeated acts of academic misconduct may result in more serious actions such as probation or suspension.
For tips on how to avoid plagiarism see the following link at the writing center.
http://writing.wisc.edu/Handbook/QuotingSources.html

LECTURE READINGS

Please see the additional document on Class Readings for full details of reading assignments. These are required readings that are meant to supplement the lecture material. You will be expected to know the information covered in these readings for the exams. All readings except for the textbook are available as PDF documents on Learn@UW. The main textbook is:

Title: Climate Change Biology
Author: Lee Hannah
Publisher: Academic Press
You may purchase the text through your favorite local or on-line bookseller.

FINAL GRADING SCHEMA

All grades for assignments and exams will be reported as a percentage and final grades will be calculated based on grading components above.

LETTER GRADE	NUMERICAL RANGE
A	**93-100%**
AB	**88-92%**
B	**83-87%**
BC	**78-82%**
C	**70-77%**
D	**60-69%**
F	**0-59%**

CLIMATE CHANGE ECOLOGY
Lecture Schedule FALL 2014

Date	Week	Lecture	Class Unit	Lecture Topic
02-Sep	1	1.A	Overview	Introduction to Course; Knowledge Survey
04-Sep	1	1.B	Trends and Changes	Climate System: A Brief Introduction
09-Sep	2	1.C	Trends and Changes	Changes in Temperature and Precipitation
11-Sep	2	1.D	Trends and Changes	Changes in Snow, Ice, and Extreme Events
16-Sep	3	1.E	Trends and Changes	Modeling Future Climate Change
18-Sep	3	1.F	Trends and Changes	Wisconsin Climate Change
23-Sep	4	1.G	Trends and Changes	Past Warming and Vulnerability
25-Sep			***Exam 1 Trends and Changes***	
30-Sep	5	2.A	Ecological Impacts	Phenology and Life Histories
02-Oct	5	2.B	Ecological Impacts	Phenological Mismatch
07-Oct	6	2.C	Ecological Impacts	Population Dynamics, Stability, and Synchrony
09-Oct	6	2.D	Ecological Impacts	Biotic Interactions and Community Dynamics
14-Oct	7	2.E	Ecological Impacts	The Niche Concept
16-Oct	7	2.F	Ecological Impacts	Range Dynamics and Distributional Shifts
21-Oct	8	2.G	Ecological Impacts	Ecosystem Changes
23-Oct	8	2.H	Ecological Impacts	Biodiversity Changes
28-Oct	9	2.I	Ecological Impacts	Evolutionary Consequences
30-Oct	9	2.J	Ecological Impacts	Phenotypic Mismatch
04-Nov	10	2.K	Prediction	Bioclimatic Modeling
06-Nov	10	2.L	Prediction	Community Modeling
11-Nov			***Exam 2 Ecological Impacts and Prediction***	
13-Nov	11	3.A	Adaptation	Ecological Monitoring and Management
18-Nov	12	3.B	Adaptation	Assisted Colonization
20-Nov	12	3.C	Adaptation	Conservation and Landscape Planning
25-Nov	13	3.D	Adaptation	Vulnerability Assessments
27-Nov	13		**THANKSGIVING BREAK**	
02-Dec	14	3.E	Adaptation	Communicating Climate Change
04-Dec	14	3.F	Adaptation	Guest Lecture (WI DNR)
10-Dec	15		Group	**Group Final Presentations**
12-Dec	15		Group	**Group Final Presentations**