

Global Environmental Change

Professor Elizabeth Burakowski

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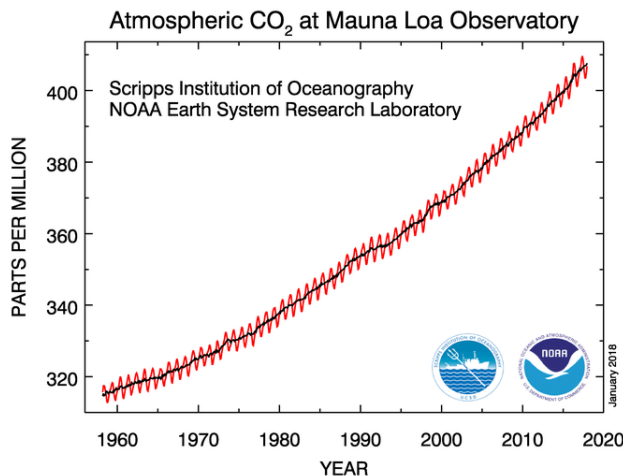
The Course

Human activity rivals nature as an agent of change in the global environment. The course explores evidence of environmental change in Earth's crust, hydrosphere, biosphere and atmosphere; and considers prospects for future sustainability, human health, diversity, and economic development. You will learn problem solving through critical analysis of environmental variables and discussion of multiple readings.

We seek to understand the complex and evolving nature of global environmental change and to begin the process of using this knowledge.

Learning Objectives *(what you should come away with)*

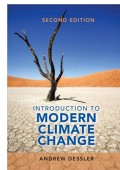
1. Describe key components, interactions, and concepts that characterize the modern Earth system.
2. Understand aspects of change over space and time on scales relevant to the Earth system.
3. Describe and evaluate the relative importance of various natural processes and anthropogenic (i.e., human) activities that shape the modern Earth and lead to global environmental change.
4. Calculate a budget (e.g., of carbon or water) and how changes occur over time. Understand concepts of storage, fluxes, and steady state balance.
5. Understand how UNH is working to reduce greenhouse gas emissions and adapt to climate change at UNH, and how these efforts fit into a larger sustainability initiatives at UNH.
6. Develop an appreciation for the scientific method.
7. Read, discuss, and summarize the main points presented in scientific papers relating to global environmental change.
8. Learn data analysis tools, collaboration, and effective communication.



Mauna Loa, Hawaii carbon dioxide record, 1958-2017
www.esrl.noaa.gov/gmd/ccgg/trends/

Required Reading

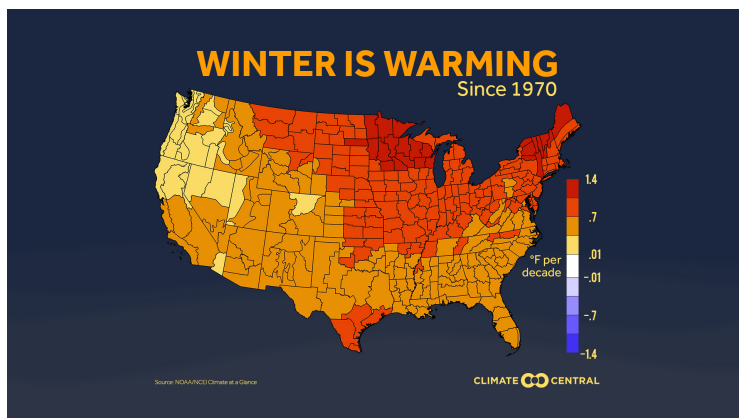
Andrew Dessler (2016)
Introduction to Modern Climate Change.
 Second Edition.



Elizabeth Kolbert (2014)
The Sixth Extinction: An Unnatural History



Additional readings (primarily scientific papers) and videos will occasionally be posted on the UNH myCourses website. These will be mentioned in class and recitation and you will be required to read/view these and will be responsible for the content.



Winter (Dec through Mar) Temperature Trend (in °F/decade), 1970-2017. Data from NOAA/NCEI.

SCHEDULE

Class

Tu/Th 11:10 AM-12:30 PM James G46

Recitation

- (1) Th 2:10 – 3:00 PM James 240
- (2) Th 3:10 – 4:00 PM James 240
- (3) Th 4:10 – 5:00 PM James 240
- (4) Th 5:10 – 6:00 PM James 240

CONTACT INFORMATION

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TA Nathan Corcoran

Office: James 340
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 Office Hours: TTh 1-2 PM; or by appointment

TA Natalie Kashi

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 E-mail: natalie.kashi@unh.edu
 Office Hours: Wed 12:30-1:30 AM; Fri 10:30-11:30 or by appointment

GRADING

Exam 1	15%
Exam 2	15%
Exam 3	15%
Written Reviews & Recitation Homework	35%
Participation	20%
Online Quizzes	0%

Course Outline: Lectures & Recitation

WEEK	DATES	LECTURE TOPICS	RECITATION	ASSIGNMENTS (Due 5 PM Fri)
PART I: THE EARTH SYSTEM				
1	Jan 23-25	Course Overview; Climate vs. Weather	Introduction to recitation; student photos	Watch Earth: The Operators' Manual (TOM); Read Dessler Ch 1&2
2	Jan 30-Feb 1	Earth System: Components	Discuss Earth TOM video & Dessler Ch 1&2; Start NH Climate Change (NHCC) Research Project	Read Dessler Ch 3&4; Submit "review" of Earth TOM (1 p; double-spaced, 12 pt Arial font)
3	Feb 6-8	Earth System: Interactions	Discuss Dessler Ch 3&4; Analyze climate data 1895-2012 for NHCC Research Project	Read Dessler Ch 5&6; Submit DRAFT PowerPoint slides of NHCC analysis
4	Feb 13-15	New England Climate System	Present NHCC results; Tutorial for EXAM 1	Submit 2 page Executive Summary NHCC results; Read Dessler Ch 7
5A	Feb 20	EXAM 1		
PART II: CHANGE IN THE EARTH SYSTEM				
5B	Feb 22	Merchants of Doubt (in class)	Discuss Merchants of Doubt	Submit MOD review (1 p, double-spaced, 12 pt. Arial font)
6	Feb 27-Mar 1	Proxy Records	Discuss exam questions; Discuss Dessler Ch 5,6,7	Read Wake et al., (2014) Climate Change in Southern NH (CC-SNH)
7	Mar 6-8	Snowball Earth; K-T Boundary; Eocene; Quaternary	Discuss CC-SNH; Introduce UNH WildCAP	Read Kolbert, Ch. 1-3; Read WildCAP; Submit review of Ch IV of CC-SNH
	Mar 12-16	UNH SPRING BREAK	NO CLASSES OR ASSIGNMENTS	
8	Mar 20-22	Last Glacial Age; Holocene	Discuss Kolbert, Ch 1-3; Discuss WildCAP	Read Kolbert, Ch. 4-6; Read Dessler, Ch. 8 & 9; Submit review of WildCAP
9	Mar 27-29	Recent & Future Global Climate Change	Discuss Kolbert, Ch 4-6; Introduce CO2 calculations	Read Kolbert, Ch. 7-9; Submit CO2 homework1

10	Apr 3-5	Northeast Climate Change	Discuss Kolbert, Ch 7-9; Tutorial for Exam 2	Read Contosta et al. 2017
11A	Apr 10	EXAM 2	Discuss Kolbert, Ch 10-13;	
11B	Apr 12	Guest Lecture: Alix Contosta – The Vernal Window	TBD	Read Protect Our Winters Report, 2018 Submit book review of Kolbert
PART III: SEARCH FOR SUSTAINABILITY				
12	Apr 17-19	Climate Change & the Ski Industry	Discuss exam questions; Start Industry Adaptation research	Submit outline of Industry Case Study Adaptation Plan
13	Apr 24-26	Sustainability; Sea Level Rise	Continue Industry adaptation research	Submit first draft of Briefing Paper on Industry adaptation plan
14	May 1-3	Human population	Tutorial for Exam #3	Submit final draft of Briefing Paper on Industry adaptation plan
15	May 15	EXAM 3	1:00 - 3:00 PM	

FAQs: Questions and Answers

<i>I want to drop (or add) this course. Like, right now!</i>	You can drop this course online. If you want to add the course, go to James 214 and talk to Sue Clark ASAP.
<i>Can I switch recitation sections? Do I have to come to recitation?</i>	You can switch recitation sections if there is space available and if you can commit to coming to the new section. You are not to float from section to section. And yes, you have to come. This is an important part of the course.
<i>What are we reading and why?</i>	See the required reading section and the instructions for each of the recitations (handed out weekly). You will read these books, associated complementary readings, discuss them in recitation, and write reviews of some the readings. This is an important part of your grade.
<i>Can I turn in assignments late?</i>	Yes. Ten percent off for each day late (this includes weekend days).
<i>What if I don't go to class?</i>	There is a reason we have classes; the goal is for a lot of the learning to happen then. I will try to keep things interesting and you should try to show up. Also, much of the material you are responsible for learning will only be presented in class.
<i>Do I have to attend recitation?</i>	Attendance in the recitation is MANDATORY. If you do not attend the recitation, you will fail this class. The recitation is designed to reinforce the material presented in class, to discuss readings, to introduce some new material, and to learn how to work in groups. Note that most of the recitation work and some of the class work will be done in groups. This is a reflection of life in the real world.

<i>Can I use my cell phone in class?</i>	To ensure a climate of learning for all, disruptive or inappropriate behavior may result in exclusion (removal) from this class. Also, cell phone/tablet/etc. use, including text messaging, is not permitted in this class by Faculty Senate rule unless by instructor permission; the exception will be for in-class online quizzes.
<i>What if I miss an exam?</i>	Make the necessary arrangements with the TA and Professor if you foresee missing an exam. We will work to provide a time for a make up exam.
<i>What if I need help with my writing skills?</i>	Set up a meeting with the Connors Writing Center http://www.unh.edu/writing/cwc/
<i>Are there additional resources to help with academic success?</i>	Center for Academic Resources https://www.unh.edu/cfar
<i>Do I have to take the online quizzes?</i>	You do not HAVE to take them, but we provide the quizzes to help you identify the most important aspects of the lecture material and to help you study.
<i>Does this class satisfy the requirement for a Discovery Lab (DLab)?</i>	NO. This class does have a weekly one-hour recitation; however, this does not qualify it as a Discovery Lab course. The Professor WILL NOT sign any petitions to have this class considered as a DLab. Note the class does satisfy the Discovery Physical Science (PS) requirement. http://www.unh.edu/registrar/registration-courses/discovery-program.html
<i>What is the UNH Academic Honesty Policy?</i>	Honesty is a core value at the University of New Hampshire. The members of its academic community both require and expect one another to conduct themselves with integrity. https://d7admin.unh.edu/student-life/09-academic-honesty-2017
<i>What is plagiarism?</i>	The unattributed use of the ideas, evidence, or words of another person, or the conveying of the false impression that the arguments and writing in a paper are the student's own. http://cola.unh.edu/plagiarism-tutorial-0
<i>What is SAS?</i>	Student Accessibility Services. According to the Americans with Disabilities Act, each student with a disability has the right to request services from UNH to accommodate his/her disability. If you are a student with a documented disability or believe you may have a disability that requires accommodations, please contact SAS at 201 Smith Hall, 603-862-2607, sas.office@unh.edu . www.unh.edu/studentaccessibility
<i>Where can I seek help for emotional or mental health distress?</i>	Your academic success in this course is very important to me. If, during the semester, you find emotional or mental health issues are affecting that success, please contact Psychological and Counseling Services (PACS) (3rd floor, Smith Hall; 603-862-2090/TTY: 7-1-1). http://www.unh.edu/pacs/
<i>What is mandatory reporting?</i>	We are committed to assuring a safe and productive educational environment for all students and for the university as a whole. To this end, the university requires faculty members to report to the university's Title IX Coordinator any incidents of sexual violence and harassment shared by students. http://www.unh.edu/affirmativeaction/reporting-students