

Environmental Systems/Global Environmental Change

Geog. 415/694v; Fall 2007

Instructors: Amy E. Hessler, Associate Professor Geography and R. Stockton Maxwell, PhD Student Geography
Time: T/TH 10-11:15am
Place: 302 Brooks Hall

A note about the instructors: Amy Hessler will be teaching the first 6 weeks of the course. Stockton Maxwell will teach the remainder of the course. Contact Stockton Maxwell beginning October 1, unless you hear otherwise.

Amy Hessler

Office Hours: T/TH 11:30am-12:30pm; Aug. 20 - Sep. 28
Office: G-49 Brooks Hall
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Stockton Maxwell

Office Hours: T 11:30-1pm; Oct. 1 – Dec. 15
Office: 222 Brooks Hall
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The Earth and its systems have a long history of variability and change. Global change is a relatively new area of interdisciplinary scientific research that addresses how Earth systems change and assesses the influence of human activity on these systems. Global change research encompasses a wide variety of study areas, including atmospheric sciences, ecology, terrestrial processes and social and economic changes related to resource use. The purpose of this course is to provide students with a broad interdisciplinary framework for understanding the relevance of current global changes relative to the past, the interconnections between human and natural processes affecting the Earth, and policies that might address these dramatic changes in Earth's systems.

Readings:

There is no required textbook for this course. However, readings are required on a weekly basis and you will be held accountable for completing them. Readings will be available through electronic reserves. You will need your own username and password (the same ones you use for access to the library computers) plus my username and password for the class:

Website: <http://www.libraries.wvu.edu/reserves/>

Professor's Username: Hessler

Professor's Password: 422

Please refer to the class schedule for readings and their assigned dates.

Recommended Reading for Geog 694v:

Steffen, W. et al. 2005. *Global Change and the Earth System: A Planet Under Pressure*. Springer.

Available on traditional reserve at the downtown library and from Amazon.com for \$95.

Requirements:

In Class Quizzes: Weekly open note/reading quizzes (each worth 10 pts.) will be designed to assess your learning from the readings. Be prepared. Do the readings in advance of class and bring your copies and notes to class. These quizzes will take the place of mid term and final exams.

Mid-term Project: Choose among several non-fiction books documenting some aspect of global environmental change and write a 5 page critical review of the book. Additional books may be approved by the instructor. These five texts are also on traditional reserve if you would like to look them over before you choose one.

Cone, Marla. 2005. **Silent Snow: The Slow Poisoning of the Arctic**. Grove Atlantic. How pollutants are making their way into people and ecosystems of the Arctic.

Kolbert, Elizabeth. 2006. **Field Notes from a Catastrophe: Man, Nature, and Climate Change**. Bloomsbury USA. A highly accurate and personable portrayal of the science and evidence of climate change.

Safina, Carl. 1999. **Song for the Blue Ocean: Encounters Along the World's Coasts and Beneath the Seas**. Henry Holt and Co. Wide ranging and fascinating perspectives on the decline of global fisheries.

Wells, Spencer. 2004. **The Journey of Man: A Genetic Odyssey**. Random House. The history of human migration told through genetics.

Ward, Diane Raines. 2003. **Water Wars: Drought, Flood, Folly and the Politics of Thirst**. Riverhead Trade. Current and historical perspectives on the changing distribution of water (fresh and saline) globally.

Final Project (Geog 415): Poster and poster presentation documenting the local impact of some global environmental change in a particular place or region.

Examples:

Climate change/sea level rise impacts on small island states

Ozone depletion effects on Australian skin cancer rates

Loss of freshwater supply from glaciers for Peru, India or Switzerland

Impacts of exotic species on forestry in New Zealand (WV?)

Requirements for Geog 694v:

All of the above, with the following change and addition:

Final Project: Paper documenting the local impact of some global environmental change in a particular place or region. Paper should be 10-15 pages double-spaced. **Meet with Dr. Hessler before Oct. 1 to discuss your topic.**

Lecture: Choose one lecture topic from the schedule and prepare a lecture or activity appropriate for the class. Instructor and peers in 694v will give you feedback on lecture. Instructor will determine a grade (out of 50 points) based on that feedback. **Choose a topic by August 28th.**

Students are encouraged to pick a similar topic for the lecture and paper.

Requirements (Geog 415)		Points
In class quizzes	10 x 10 points each	100
Mid-term Book Review		100
Final project		150
Poster presentation		50
Total Points		400

Requirements (Geog 694v)		Points
In class quizzes	10 x 10 points each	100
Mid-term Book Review		100
Final paper		150
Lecture		50
Total Points		400

Grade	Points Required
A	>360
B	320-359
C	280-319
D	240-279
F	<240

General Expectations:

- 1) Attendance is required. Though I will not take role, regular quizzes (see **Requirements** above) will reward those who attend regularly. University-sanctioned absences will be excused. Regardless of your absence, YOU are responsible for getting the notes and making up assignments or quizzes. ***If at all possible***, contact the instructor in advance of any absence.
- 2) Readings are required and content from the readings will be included on quizzes.
- 3) You will be asked to work with others in class. Please respect them and their intellectual property. If you have questions about student conduct, please refer to the student handbook (<http://www.arc.wvu.edu/rightsa.html>).
- 4) You must have internet access to complete some assignments. There are many locations on campus where you can access the internet, such as the downtown library or the White Hall computer lab.

Grading Policies

- 1) Assignments are due at the **beginning** of class. Do not turn in assignments while the instructor is lecturing!!!!
- 2) Late assignments will receive 50% credit and may be turned in late until the last day of classes. Better late than never!

Social Justice Statement

West Virginia University is committed to social justice. I support that commitment and expect to maintain a positive learning environment based upon open communication, mutual respect, and non-discrimination. Our University does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color or national origin. Any suggestions as to how to further such a positive and open environment in this class will be appreciated and given serious consideration. If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangements.

Academic Honesty Statement

By enrolling in this course, you agree to follow University guidelines, as outlined in The Mountie. For further information, please refer to: <http://www.arc.wvu.edu/rightsa.html>.

Dates	Topic	Tues.	Tues. Reading	Thurs.	Thurs. Reading	Steffen
8/21, 23	What is Global Change?	Overview Lecture	Crutzen 2002: The Anthropocene	Global Change?	Vitousek et al 1997_intro	1
8/28, 30	Time, Cycles of Change, Past Change	Atmospheric Composition and Climate Variability Over Time	Raynaud et al. 2000	UA Malcolm Hughes Lecture	McKibben 2007	2
9/4, 6		Global Ecosystems and Variability	Vitousek 1994	Human Population: NOVA?	https://www3.nationalgeographic.com/genographic/atlas.html	2
9/11, 13	Atmospheric Composition and Change	Ozone depletion	Steffen 2005 pp. 235-238	Disruption of Key Nutrient Cycles, Mercury in fish exercise	Galloway et al 2003	3.3.6, 4.5
9/18, 20		Anthropogenic Greenhouse Effect	Kolbert 2005, I-III	Anthropogenic Greenhouse Effect	Kolbert 2005, I-III	4
9/25, 27	Climate Change Impacts	Loss of ice sheets and glaciers (Josh Wixom)	Alley et al 2005	Abrupt Climate Change; Hurricanes (Cary Lynch)	Alley et al. 2003	p. 150-151; 261-262
10/2, 4		Changing species ranges	Krajik 2004	Effects of CO2 on plant physiology (Richard Thomas)	TBA	4

10/9, 11	Water/Hydrosphere	Water Resources	Vorosmarty et al 2000	Ocean Acidification; Case Study: Coral Bleaching in the Caribbean Sea	Ruttiman 2006;. Stone and Pala 2007	3.3.3, 3.3.4
10/16, 18	Biodiversity and Extinction	Extinction	Pimm et al. 1995	Terrestrial: Case Study: Pollinators (Bees)	Stokstad 2006; Biesmeijer et al 2006	3.35
10/23, 25		Coastal, Oceans (Jeff Dunn)	Stokstad 2006_biodiversity; Worm et al 2006	Invasives as Global Change	Vitousek et al. 1997	
10/30, 11/1	Land Use/Land Cover Change	Forest Fragmentation (Melissa T-VG)	Skole and Tucker 1993	Desertification (Tom Saladyga)	Reynolds et al 2007	4.3
11/6, 8	Behavioral, Social, Economic Dimensions	Urbanization and Globalization	Steffen 2005 pp.123-129	Agricultural productivity (Aaron Burkholder)	Vitousek et al 1986	5
11/13, 15		Vulnerability of human populations	Messerli et al 2000	Demographic transition (Ann Oberhauser)	TBA	5
11/20, 22		UA Andrew Comrie Lecture	Kolivras and Comrie 2004	Forecasting Change	Clark et al. 2001	5

11/27, 29	Living with Global Change	Anticipating and Adapting to Global Change	Lohr 2007 NYTimes	Alyse Gilmer Lecture; UA Paul Portney lecture; Market-based trading:Cap and Trade Systems, Taxation etc.	TBA	5, 6
12/4, 6	Poster Presentations	Poster Presentations		Poster Presentations		
12/13 11-1pm	Poster Presentations					