

Environmental Systems/Global Environmental Change

Geog. 415W; Fall 2009

Time and Place:

T/TH 10-11:15am
302 Brooks Hall

Prerequisites:

Geography 107, English 101, 102
Junior or Senior standing

Instructor:

Amy E. Hessler, Associate Professor Geography

Office Hours: T/TH 11:30am-12:30pm
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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.

W Course Requirement

This course is a part of WVU's General Education Curriculum Writing Program and focuses on developing higher-level skills in written communication. As such, the prerequisites for the writing-intensive section of the course are ENG 101 and 102.

Expected Learning Outcomes

- 1) Students will be able to identify the major changes in Earth systems during the last few centuries.
- 2) Students will be able to contrast these changes with historic variability in these Earth systems over millennia.
- 3) Students will be able to describe key feedbacks, thresholds and interactions in Earth's systems.

- 4) Students will be able to characterize the role that human societies play in shaping and affecting Earth systems.
- 5) Students will be able to characterize vulnerabilities of human societies to variability in the Earth's systems.
- 6) Students will be able to critically evaluate a popular book addressing some aspect of change in the Earth's systems.
- 7) Students will be able to review original research papers on a specific aspect of Earth's systems and communicate that topic to a broad audience in a poster presentation (oral and written).
- 8) Students will be proficient in combining the use of illustrations with technical prose to communicate effectively.
- 9) Students will be able to present technical material to a general audience via a poster and poster presentation.

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 ecampus. See schedule below for required readings.

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.

Article Summaries: Students enrolled in 415W will be required to complete 5 two page (250 word) summaries of the readings. Students may choose from any of the readings that were assigned prior to the due date of each summary (see schedule below). Summaries will be returned to the student by the next class meeting with comments/suggestions for improvement. Students must then revise and resubmit their summaries for a grade within 1 week of their return. ***Deadlines listed are for first drafts!!***

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. First draft of this project is due on week 4. Projects will be returned to students with comments/suggestions for improvement within one week. Students must then revise and resubmit their project for a grade within in 1 week following its return. Some projects may require multiple revisions.

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.
- McKibben, Bill. 1989. **The End of Nature**. Anchor Books. Thought provoking and controversial book about whether global anthropogenic changes have altered our perception of nature.
- 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.

Final Project (Geog 415w): Poster and poster presentation documenting the local impact of some global environmental change in a particular place or region. The poster must include at least 1300 words and must be written in a paper (rather than bulleted) style. First draft of this project is due at the end of week 12 and the second draft is due at the end of week 14. Drafts should be submitted as papers. Papers will be returned to students with comments/suggestions for improvement. Students must then revise and resubmit their project for a grade within 2 weeks. Some projects may require multiple revisions.

Example Topics:

- 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 (Geog 415)		Points
In class quizzes (best of 10)	10 x 10 points each	100
Article Summaries	5 x 10 points each	50
Mid-term Book Review		100
Final project		100
Poster presentation		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 Brooks Hall computer labs, the downtown library, and the White Hall computer lab.
- 5) As a W course, this course requires 20 pages of writing plus multiple opportunities to revise your work. As such, this course requires a large time commitment from the student.

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	Lecture	Reading	Assignments Due
Week 1	What is Global Change?	Overview Lecture	Crutzen 2002: The Anthropocene	
		Global Change?	Vitousek et al 1997_intro	
Week 2	Time, Cycles of Change, Past Change	Atmospheric Composition and Climate Variability Over Time	Raynaud et al. 2000	Article 1 summary draft 1 due
		UA Malcolm Hughes Lecture	McKibben 2007	
Week 3		Global Ecosystems and Variability	Vitousek 1994	
		Human Population: NOVA?	https://www3.nationalgeographic.com/genographic/atlas.html	Article 1 final summary due
Week 4	Atmospheric Composition and Change	Ozone depletion	Steffen 2005 pp. 235-238	First Draft Book Review Due
		Disruption of Key Nutrient Cycles, Mercury in fish exercise	Galloway et al 2003	Article 2 summary draft 1 due
Week 5		Anthropogenic Greenhouse Effect	Kolbert 2005, I-III	
		Anthropogenic Greenhouse Effect	Kolbert 2005, I-III	Final Draft Book Review Due
Week 6	Climate Change Impacts	Loss of ice sheets and glaciers	Alley et al 2005	Article 2 final summary due
		Abrupt Climate Change; Hurricanes	Alley et al. 2003	

Week 7		Changing species ranges	Krajik 2004	Article 3 summary draft 1 due
		Effects of CO2 on plant physiology	TBA	
Week 8	Water/Hydrosphere	Water Resources	Vorosmarty et al 2000	
		Ocean Acidification; Case Study: Coral Bleaching in the Caribbean Sea	Ruttiman 2006; Stone and Pala 2007	Article 3 summary final due
Week 9	Biodiversity and Extinction	Extinction	Pimm et al. 1995	
		Terrestrial: Case Study: Pollinators (Bees)	Stokstad 2006; Biesmeijer et al 2006	Article 4 summary draft 1 due
Week 10		Coastal, Oceans	Stokstad 2006_biodiversity; Worm et al 2006	
		Invasives as Global Change	Vitousek et al. 1997	
Week 11	Land Use/Land Cover Change	Forest Fragmentation	Skole and Tucker 1993	Article 4 summary final due
		Desertification	Reynolds et al 2007	
Week 12	Behavioral, Social, Economic Dimensions	Urbanization and Globalization	Steffen 2005 pp.123-129	First Draft Poster Due
		Agricultural productivity	Vitousek et al 1986	Article 5 summary draft 1 due
Week 13		Vulnerability of human populations	Messerli et al 2000	
		Demographic transition	TBA	
Week 14		UA Andrew Comrie Lecture	Kolivras and Comrie 2004	Article 5 summary final due

		Forecasting Change	Clark et al. 2001	Second Draft Poster Due
Week 15	Living with Global Change	Anticipating and Adapting to Global Change	Lohr 2007 NYTimes	
		Market- based trading:Cap and Trade Systems, Taxation etc.	TBA	
Week 16	Poster Presentations and Final Posters Due			
	Poster Presentations and Final Posters Due			

General Rubric for Writing Assignments:

5: This is an outstanding essay which reflects a perceptive and thoughtful response to the assignment. It is well organized with excellent development of its ideas and reflects the writer's command of appropriate rhetorical strategies. The prose is vigorous and fresh, and the writer is clearly in control of the standard conventions of American prose.

4: This is a very good essay that fulfills the assignment and shows evidence of clear thought and good planning. It is well organized with good supporting details. The writing is fluent, and there are only minor errors in the mechanics of writing which do not interfere with reading the essay.

3: This is a satisfactory essay which fulfills the assignment and is adequately developed. The writing is clear and coherent with relatively few errors in usage and mechanics, but the writer fails to demonstrate any particular strength which would distinguish an above-average essay.

2: This is a below-average essay which fulfills the assignment but exhibits major problems in writing. It may have difficulty with the presentation of ideas (e.g., lack of a clear thesis, weak organization, poor development of ideas, or inappropriate diction, poor spelling) or be marred by enough errors in the mechanics of writing to seriously distract the reader.

1: This is an essay that relates to the topic but is so poorly presented that it fails to fulfill the assignment. It fails to present its basic ideas, either because of poor organization and lack of clarity or because the writing reflects a lack of control over the basic conventions of standard American usage. Such an essay may have sentence boundary problems, poor use of idiom, inappropriate diction (words used incorrectly), agreement errors, or verb tense problems.

0: This is an essay that represents dishonest work by the student, principally the use of ideas or writing which are clearly not one's own work. Refer to the West Virginia University Undergraduate Catalog for the University policy on Academic Dishonesty.

Critical Review of Non-Fiction Book: Rubric

Book Choice Due: Aug. 28; Review Due: Sept. 27

	Exemplary	Possible Pts.	Earned Pts.
Summary	Includes a discussion of major themes, ideas and concepts related to GEC*. Author's aims are described clearly. Combines ideas from the book into new sentences using your own words.	20	
Critique	Critique consists of thoughts, responses, and reaction to the book including reactions to >3 aspects. Reviewer reacts to the author's aims, subject of book, how well it is written and overall success of the book, within the context of GEC.	20	
Organization	Structure of paper flows and is easily read because of smooth transitions between paragraphs. Each paragraph has a topic sentence and several supporting ideas. The sequence of topics is in logical order. There is a clear cut introduction, body and conclusion.	20	
Application of GEC Concepts	At least three major GEC concepts discussed in class are addressed in the review. Student critically evaluates how well the book addressed these concepts and whether any concepts were missing that should have been included.	20	
Mechanics	All direct quotes from the book are in quotation marks and page numbers are noted in parentheses. There is a correctly formatted works cited at end of review. Formatting, style, punctuation, and grammar are without error.	10	
Length	Paper is the assigned length (~5 pages or ~1300 words)	10	
Total Points		100	

****GEC refers to Global Environmental Change (the course topic).***

Poster Rubric

<i>Element</i>	Possible Points	Earned Points
Focus The topic is clear. Includes an appropriate title and purpose/objectives statement.	10	
Main Ideas The main ideas are appropriate to the topic/assignment and are presented in the introduction.	10	
Supporting Details Appropriate and accurate details support each main idea.	10	
Flow Paragraphs and sections are linked together.	10	
Citations Primary sources are accurately cited in text.	5	
References Cited section Consistently and appropriately formatted with citations for all materials referenced in text.	5	
Drawings and Illustrations All illustrations, photographs, and drawings add to the purpose and interest of the poster.	10	
Mechanics There are no errors in capitalization, grammar punctuation, or spelling.	10	
Layout and Design The overall organization, design, use of color, and use of space help to make the poster interesting and to communicate the message.	10	
Creativity The poster is highly original and creative.	10	
Neat and Presentable The poster is very neat and presentable.	10	
Total:	100	