

## **PubH 6100-001**

### **Global Climate Change, Sustainability, and Human Health Spring Semester 2009**

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**Credits:** 2

**Meeting Days/Time:** Tuesday 6-8pm

**Meeting Place:** TBD

**Instructor:** Matthew Commers, PhD, MPH

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#### **I. Course Description**

This course will introduce students to a full continuum of analytical perspectives on global climate change and its documented and projected implications for human health. The course will begin by exploring theories of health causation that address and detail the ways in which physical and social environments impact human health. We will then proceed to examine the publications of the United Nations International Panel on Climate Change and other significant sources regarding how climate change will likely impact Earth's biosphere. The implications of those changes for human health will comprise the third and most substantial portion of the course. The course will conclude with a focus on public policies and technologies that promise to enhance our ability to mitigate and/or adapt to the "climate crisis" before us. The specific roles of public health professionals in adaptation and mitigation will be discussed both as a function of formal public health activity and more widely.

#### **II. Course Prerequisites**

There are no prerequisites for this course.

#### **III. Course Goals and Objectives**

The overarching goal of this course is to give students an understanding of both the likely and possible implications of climate change for human health.

Course objectives include:

- To gain a deeper understanding of theories of health causation that allow for understanding how social, economic, and environmental forces support and/or impinge upon health status;
- To gain a basic but rigorous understanding of the findings and scientific reasoning in the reports of the Intergovernmental Panel on Climate Change;
- To establish an understanding of how the environmental effects of climate change intersect with theories of human health causation;
- To learn about a broad array of potential solutions to the challenge of climate change for health, including a variety of strategies for both mitigation of and adaptation to climate change.

#### IV. Methods of Instruction and Work Expectations

- Lectures by course instructor and numerous guest speakers.  
Students will be expected to spend about 4 hours reading materials each week, not including preparation for quizzes, mid-term exam, and the written project (see below).
- Quizzes, lasting approximately 5-10 minutes, will be administered biweekly.  
The quizzes will cover key points from the previous lectures and assigned readings.
- Mid-term exam.  
As this is a public health course, the mid-term exam will focus explicitly on the health theory that has been presented and discussed, and the theoretical connections between climate change and human health.
- Grades will be assigned for classroom participation.  
Students will be able to obtain full credit for classroom participation by asking questions, participating in discussions and hands-on activities.
- Written project.  
Each student will be required to write a final paper of approximately 2,500 words. The paper will introduce one of the potential or documented challenges of climate change to one or more public health outcomes. The bulk of the paper will be devoted to one or more plausible ways of mitigating the worst effects of climate change on public health.
- SONY readers.  
SONY Electronics, Inc. has agreed to sponsor this course by providing up to 40 digital readers for free to the first 40 students who register for the class. Students who accept a free reader (valued at \$400+) may keep their reader upon completion of the course if they have participated fully in the SONY evaluation of the functioning of the reader within the context of the course.

#### V. Course Literature

**Required Readings:** Please note, copies of journal articles are not supplied unless specified. Students are responsible for downloading all course materials and completing pre-course assignments.

**To access the articles with a PMID number,** go to the PubMed website at <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi>  
Type in the PMID number listed on the course materials, click the go button

This takes you to a citation page, click on the author name  
This takes you to the abstract page, click on the journal title button  
This takes you to the full journal article

**To access all other articles**, go to the U of MN libraries website at  
<http://www.lib.umn.edu/articles/ej.phtml>

Type in the journal title in the "Search For" box, click the go button  
This takes you to a list of possible journal titles, click on the title you want  
This takes you to a search form, fill in citation information, click the go button  
You will be prompted to login with your X.500 number and password  
This will take you to the journal and the abstract of the article  
Find on the page where it says Full Text or PDF (it is different for each journal), click on that and the full text will open.

Antonovsky, A. (1979). Health, Stress, and Coping. Berkeley, University of California Press.

Antonovsky, A. (1987). Unraveling the Mystery of Health: How People Manage Stress and Stay Well. San Francisco, Jossey-Bass Publishers.

Arnell, N. W. (1999). "Climate change and global water resources." Global Environmental Change 9(Supplement 1): S31-S49.

Arnell, N. W. (1999). "Climate change and global water resources." Global Environmental Change 9(Supplement 1): S31-S49.

Arnell, N. W. and E. K. Delaney (2006). "ADAPTING TO CLIMATE CHANGE: PUBLIC WATER SUPPLY IN ENGLAND AND WALES." Climatic Change 78(2-4): 227-255.

Bell, M. L., R. Goldberg, et al. (2007). "Climate change, ambient ozone, and health in 50 US cities." Climatic Change 82(1/2): 61-76.

Campbell-Lendrum, D. and R. Reithinger (2002). "Dengue and climate change." Trends in Parasitology 18(12): 524.

Campbell-Lendrum, D. and R. Woodruff (2006). "Comparative Risk Assessment of the Burden of Disease from Climate Change." Environmental Health Perspectives 114(12): 1935-1941.

Campbell-Lendrum, D., C. Corvalán, et al. (2007). "Global climate change: implications for international public health policy." Bulletin of the World Health Organization 85(3): 235-237.

Cifuentes, L., V. H. Borja-Aburto, et al. (2001). "Hidden Health Benefits of Greenhouse Gas Mitigation." Science 293(5533): 1257.

Corvalan, C. F. and J. A. Patz (2004). "Global warming kills trees, and people." Bulletin of the World Health Organization 82(7): 481-481.

Dubos, R. (1959). Mirage of Health: Utopias, Progress, and Biological Change. New York, Harper and Row.

Foley, J. A., R. DeFries, et al. (2005). "Global Consequences of Land Use." Science 309(5734): 570-574.

Haines, A. and J. A. Patz (2004). "Health Effects of Climate Change." JAMA: Journal of the American Medical Association 291(1): 99-103.

Hulme, M., E. M. Barrow, et al. (1999). "Relative impacts of human-induced climate change and natural climate variability. (Cover story)." Nature 397(6721): 688.

McMichael, A. J., B. Bolin, et al. (1999). "Globalization and the Sustainability of Human Health." BioScience 49(3): 205-210.

Patz, J. (2005). Satellite Remote Sensing Can Improve Chances of Achieving Sustainable Health. Environmental Health Perspectives: A84-A85.

Patz, J. A. (2002). "A human disease indicator for the effects of recent global climate change." Proceedings of the National Academy of Sciences of the United States of America 99(20): 12506.

Patz, J. A. (2004). "Global warming." BMJ: British Medical Journal 328(7451): 1269-1270.

Patz, J. A. and R. S. Kovats (2002). "Hotspots in climate change and human health." *BMJ: British Medical Journal* 325(7372): 1094-1098.

Patz, J. A. and S. H. Olson (2006). "Malaria risk and temperature: Influences from global climate change and local land use practices." *Proceedings of the National Academy of Sciences of the United States of America* 103(15): 5635-5636.

Patz, J. A., D. Campbell-Lendrum, et al. (2005). "Impact of regional climate change on human health." *Nature* 438(7066): 310-317.

Patz, J. A., M. A. McGeehin, et al. (2001). "The Potential Health Impacts of Climate Variability and Change for the United States. (Cover story)." *Journal of Environmental Health* 64(2): 20.

Patz, J. A., M. Hulme, et al. (2002). "Climate change (Communication arising): Regional warming and malaria resurgence." *Nature* 420(6916): 627.

Patz, J. A., P. Daszak, et al. (2004). "Unhealthy Landscapes: Policy Recommendations on Land Use Change and Infectious Disease Emergence." *Environmental Health Perspectives* 112(10): 1092-1098.

Patz, J., D. Campbell-Lendrum, et al. (2008). "Health Impact Assessment of Global Climate Change: Expanding on Comparative Risk Assessment Approaches for Policy Making." *Annual Review of Public Health* 29(1): 27-39.

Perry, M., N. Arnell, et al. (1998). "Adapting to the inevitable." *Nature* 395(6704): 741.

Pimm, S. L., M. Ayres, et al. (2001). "Can We Defy Nature's End?" *Science* 293(5538): 2207.

Wilkinson, R. and M. Marmot, Eds. (1998). Social Determinants of Health: the solid facts. Copenhagen, WHO Regional Office for Europe.

## VI. Course Outline/Weekly Schedule

### Course Outline

Week 1	Global health disparities and social-environmental health etiology
Week 2	Antonovsky and Dubos: theories of health and health causation Biweekly quiz
Week 3	Global stewardship of physical and social environments for health
Week 4	Science of global climate change and anticipated impact 1 Biweekly quiz
Week 5	Science of global climate change and anticipated impact 2
Week 6	Thermal stress Biweekly quiz
Week 7	Air and water quality
Week 8	Mid-term exam (No biweekly quiz)

Week 9	Infectious disease vectors
Week 10	Mental health Biweekly quiz
Week 11	Natural disasters
Week 12	Adaptive actions for health: role of public health Biweekly quiz
Week 13	Sustainability and mitigation of climate change: promising technologies and financing
Week 14	Sustainability and mitigation of climate change: policy-level interventions Biweekly quiz
Week 15	Integrated planning / Healthy Communities and Cities Model
Week 16	Concluding and summarizing remarks Submission of written project and SONY reader evaluations

## VII. Evaluation and Grading

Grading Basis:

- Attendance (15 points, 15% of grade)
- Biweekly quizzes (20 points, 20% of grade)
- Mid-term exam (20 points, 20% of grade)
- Written project (45 points, 45% of grade)

Making up exams, including penalties, late/missing assignments, and absence

A make-up exam will only be administered to students providing written proof of their inability to sit for the mid-term exam. If a biweekly quiz is missed, the student will receive a written make-up assignment to be completed and returned by email. Any student missing five or more class sessions will be asked to withdraw from the course and receive an F or N (as appropriate) if he or she fails to do so.

Late written projects will be evaluated on a case-by-case basis. Generally, each additional week of lateness will result in a 10% reduction (i.e. full letter grade) in the grade. No written project will be accepted more than three weeks after the final evening of the course.

The grading scale is as follows:

- A 93-100%
- A- 90-93%
- B+ 90-87%
- B 83-87%

- B- 80-83%
- C+ 77-80%
- C 73-77%
- C- 70-73%
- D 60-67%

This course is offered by A/F or S/N

- **A/F letter grade will be determined by total effort as follows:**

A = 90-100%	(4.0) Represents achievement that is outstanding relative to the level necessary to meet course requirements.
A- =	(3.67)
B+ =	(3.33)
B = 80-90%	(3.0) Represents achievement that is significantly above the level necessary to meet course requirements.
B- =	(2.67)
C+ =	(2.33)
C = 70-80%	(2.0) Represents achievement that meets the minimum course requirements in every respect.
C- =	(1.67)
D+ =	(1.0)
D = 60-70%	(1.0) Achievement that is worthy of credit even though it fails to meet fully the course requirements.
D- =	
F = below 60%	Represents failure (or no credit) and signifies that the work was either (1) completed but at a level of achievement that is not worthy of credit or (2) was not completed and there was no agreement between the instructor and the student that the student would be awarded an I.

- **S/N option must complete all assignments to a C- level (70%):**

S	Achievement that is satisfactory which is equivalent to a C- or better (achievement is at the discretion of the instructor but may be no lower than a C-).
N	Represents failure (or no credit) and signifies that the work was either (1) completed but at a level of achievement that is not worthy of credit or (2) was not completed and there was no agreement between the instructor and the student that the student would be awarded an I.

**PLEASE NOTE:**

If applicable, students may change grading options during the initial registration period or during the first two weeks of the term.

**Incomplete Grade**

A grade of incomplete "I" shall be assigned at the discretion of the instructor when, due to extraordinary circumstances, the student was prevented from completing the work of the course on time. The assignment of an incomplete requires a written agreement between the instructor and student specifying the time and

manner in which the student will complete the course requirements. In no event may any such written agreement allow a period of longer than one year to complete the course requirements.

### **University of Minnesota Uniform Grading and Transcript Policy**

A link to the policy can be found at [onestop.umn.edu](http://onestop.umn.edu).

## **VIII. Other Course Information and Policies**

### **Grade Option Change** (if applicable)

For full-semester courses, students may change their grad option, if applicable, through the second week of the semester. Grade option change deadlines for other terms (i.e. summer and half-semester) can be found at [onestop.umn.edu](http://onestop.umn.edu).

### **Course Withdrawal**

Students should refer to the Refund and Drop/Add Deadlines for the particular term at [onestop.umn.edu](http://onestop.umn.edu) for information and deadlines for withdrawing from a course. As a courtesy, students should notify their instructor and, if applicable, advisor of their intent to withdraw. See section below for rules about Public Health Institute courses.

Students wishing to withdraw from a course after the noted final deadline for a particular term must contact the School of Public Health Student Services Center at [sph-ssc@umn.edu](mailto:sph-ssc@umn.edu) for further information..

### **Student Conduct, Scholastic Dishonesty and Sexual Harassment Policies**

Students are responsible for knowing the University of Minnesota, Board of Regents' policy on Student Conduct and Sexual Harassment found at [www.umn.edu/regents/polindex.html](http://www.umn.edu/regents/polindex.html).

Students are responsible for maintaining scholastic honesty in their work at all times. Students engaged in scholastic dishonesty will be penalized, and offenses will be reported to the Office of Student Academic Integrity (OSAI, [www.osai.umn.edu](http://www.osai.umn.edu)).

The University's Student Conduct Code defines scholastic dishonesty as "plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; or altering, forging, or misusing a University academic record; or fabricating or falsifying of data, research procedures, or data analysis."

Plagiarism is an important element of this policy. It is defined as the presentation of another's writing or ideas as your own. Serious, intentional plagiarism will result in a grade of "F" or "N" for the entire course. For more information on this policy and for a helpful discussion of preventing plagiarism, please consult University policies and procedures regarding academic integrity: <http://writing.umn.edu/tww/plagiarism/>.

Students are urged to be careful that they properly attribute and cite others' work in their own writing. For guidelines for correctly citing sources, go to <http://tutorial.lib.umn.edu/> and click on "Citing Sources".

In addition, original work is expected in this course. It is unacceptable to hand in assignments for this course for which you receive credit in another course unless by prior agreement with the instructor. Building on a line of work begun in another course or leading to a thesis, dissertation, or final project is acceptable.

If you have any questions, consult the instructor.

### **Disability Statement**

It is University policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have a documented disability (e.g., physical, learning, psychiatric, vision, hearing, or systemic) that may affect their ability to participate in course activities or to meet course requirements. Students with disabilities are encouraged to contact Disability Services to have a confidential discussion of their individual needs for accommodations. Disability Services is located in Suite 180 McNamara Alumni Center, 200 Oak Street. Staff can be reached by calling 612/626-1333 (voice or TTY).