
SYLLABUS

**Global Environmental Change and Public Health
G H/ENV H 220 (3 credits)
Lectures Mondays/Wednesdays – 10:00 – 11:20 am
Room NAN 181**

Instructors:

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Course description

The world has entered a new era: the Anthropocene. Humans are the primary drivers of global environmental changes that are changing the planet on the scale of geological forces. Global environmental changes include climate change, ozone depletion, biodiversity loss, nitrogen fertilization, and ocean acidification. Students will be introduced to the range of global environmental changes and their consequences for human health and well-being, with a focus on climate change and its consequences.

Climate change is causing injuries, illnesses, and deaths, with any increase in global temperature projected to further increase morbidity and mortality from most climate-sensitive health outcomes if actions are not taken to rapidly increase adaptation and reduce greenhouse gas emissions. Of particular concern are heat-related morbidity and mortality and ozone-related mortality if emissions needed for ozone formation remain high. Urban heat islands often amplify the impacts of heatwaves in cities.

Risks for some vector-borne diseases, such as malaria and dengue fever, are projected to increase with warming from 1.5°C to 2°C, including potential shifts in their geographic range and changes in their seasonal distribution. Undernutrition is projected to increase with additional warming. Separately, increasing concentrations of carbon dioxide are expected to reduce the nutritional quality of significant cereal crops. Other potentially large risks are insufficiently quantified, such as the impacts of climate variability and change on a range of climate-sensitive health outcomes, such as diarrheal diseases, occupational heat stress, mental health, and migration and displacement. Vulnerable populations and regions will be differentially affected, with the potential to increase poverty and inequities.

Students will gain foundational knowledge in the health effects of global environmental changes, particularly climate change, benefits of policies and technologies to reduce greenhouse gas emissions and adaptation needs and strategies.

Overall learning objectives for the course

Students will be able to:

- Identify the major global environmental changes and the upstream drivers behind these changes
- Identify the health risks of climate variability and change, including the sources of vulnerability and exposure to those risks
- Identify highly vulnerable populations domestically and globally
- Identify key interventions to promote climate-resilient health systems
- Enumerate key issues in implementing, monitoring, evaluating, learning from, and continuously updating, adaptation policies and programs
- Identify the health co-benefits of mitigation policies to reduce greenhouse gas emissions

Expectations of students

Students are expected to attend lecture twice per week. Students are also expected to take the midterm exam, the final exam, and write one paper on a relevant topic chosen between the student and the instructors. (see *Grades* below)

Grades

- **30%** midterm exam
- **40%** final exam
- **30%** paper

We will use the UW's grading guidelines, available at <http://depts.washington.edu/grading/practices/guidelines.html>.

Grades for each assignment will be posted online, accessible through the course website.

Requirements

Assigned textbook and readings. Readings will be assigned every week to be completed before class. The readings will be from the assigned textbook or other sources. Alternative media sources such as videos will be included to allow for a comprehensive overview of the body of information.

Textbook:

Global Climate Change and Human Health: From Science to Practice
George Luber (Editor), Jay Lemery (Editor)
ISBN: 978-1-118-50557-1
November 2015, Jossey-Bass

Exams:

The midterm exam will take place during the 5th week of classes covering course materials until that point. It will be an in-class exam consisting of multiple choice and short answer questions.

The final exam will take place in class during finals week and will be cumulative with a focus on the new materials after the midterm. The exam will consist of multiple choice and short answer questions.

Paper. Students will write a paper on some aspect of the health risks of global environmental change, reviewing a particular health risk, or describing adaptation or mitigation options to reduce that risk, in the context of a specific country or city. The paper will be at least 10 double-spaced pages and contain a minimum of 10 references that are peer-reviewed, scholarly articles found in scientific journals. A one-paragraph summary of the topic for the individual project will be due one week after the mid-term exam on **Wednesday, February 13**. The paper will be due at the start of class on **Wednesday, March 13**. Please include your name in the file name.

Extra Credit. Students may receive extra credit for attending any event throughout the quarter relevant to the course materials and submitting a short essay about the event.

UW Disability Statement

Access and Accommodations: Your experience in this class is important to us, and it is the policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law. If you experience barriers based on a disability or temporary health condition, please seek a meeting with DRS to discuss and address them. If you have already established accommodations with DRS, please communicate your approved accommodations to your instructor at your earliest convenience so we can discuss your needs in this course.

Disability Resources for Students (DRS) offers resources and coordinates reasonable accommodations for students with disabilities and/or temporary health conditions. Reasonable accommodations are established through an interactive process between you, your instructor(s) and DRS. If you have not yet established services through DRS, but have a temporary health condition or permanent disability that requires accommodations (this can include but not limited to; mental health, attention-related, learning, vision, hearing, physical or health impacts), you are welcome to contact DRS at 206-543-8924 or uwdrs@uw.edu or disability.uw.edu

Academic Integrity Statement

Students at the University of Washington (UW) are expected to maintain the highest standards of academic conduct, professional honesty, and personal integrity. The UW School of Public Health (SPH) is committed to upholding standards of academic integrity consistent with the academic and professional communities of which it is a part. Plagiarism, cheating, and other misconduct are serious violations of the University of Washington Student Conduct Code (WAC 478-120). We expect you to know and follow the university's policies on cheating and plagiarism, and the SPH Academic Integrity Policy. Any suspected cases of academic misconduct will be handled according to University of Washington regulations. For more information, see the University of Washington Community Standards and Student Conduct website.

Classroom climate

The UW School of Public Health seeks to ensure all students are fully included in each course. We strive to create an environment that reflects community and mutual caring. We encourage students with concerns about the classroom climate to talk to your instructor, your advisor, a member of the departmental or SPH Diversity Committee and/or the program director. vg@uw.edu is a resource for students with classroom climate concerns.

Class Schedule

Class	Topic	Instructor	Assigned Readings
WEEK 1 Class 1 MON 1/7	Global environmental change: an introduction	Ebi	
WEEK 1 Class 2 WED 1/9	Weather, climate, climate variability, and climate change	Bumbaco	Luber/Lemery Text Chapter 1: Primer on Climate Science
WEEK 2 Class 3 MON 1/14	Stratospheric ozone depletion and public health	Ebi	<ul style="list-style-type: none"> • http://www.noaanews.noaa.gov/stories2011/20110216_ozone.html • http://www.ucsus.org/global_warming/science_and_impacts/science/ozone-hole-and-gw-faq.html#.VsV2NfirIU0 • https://www.youtube.com/watch?v=1Bu3vltczRw
WEEK 2 Class 4 WED 1/16	Health risks of biodiversity loss	Hess	<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=Xra87liAopM • https://www.cbd.int/doc/bioday/2007/ibd-2007-booklet-01-en.pdf • http://news.nationalgeographic.com/2015/04/150430-extinction-climate-warming-animals-species-conservation-wildlife/
WEEK 3 MON 1/21	Martin Luther King Day		
WEEK 3 Class 5 WED 1/23	Nitrogen cycle and health impacts	Ebi	<ul style="list-style-type: none"> • http://www.eoearth.org/view/article/154864/ • http://www.esa.org/esa/solutions-for-a-nitrogen-soaked-world/ • http://scied.ucar.edu/longcontent/changing-nitrogen-cycle
WEEK 4 Class 6 MON 1/28	Health exposures: weather, climate variability, climate	Ebi	McMichael AJ. 2001. Global environmental change as “risk factor”: can epidemiology cope? <i>AJPH</i> 91:1172-1175

	change, and climate change epidemiology		Xun et al. 2010. Climate change epidemiology: methodological challenges. Int J Public Health 55:85-96. Luber/Lemery Text Chapter 13: Climate Change Health Impact Projections: Looking into the Future
WEEK 4 Class 7 WED 1/30	Framework for understanding and managing risks; vulnerability and adaptation assessments	Boyer	Luber/Lemery Text Chapter 12: Climate and Health Vulnerability Assessments: A Practical Approach.
WEEK 5 Class 8 MON 2/4	Assessing and communicating health risks	Ebi	Luber/Lemery Text Chapter 16: Protecting Environmental Justice Communities from the Detrimental Impacts of Climate Change
WEEK 5 Class 9 WED 2/6	Midterm Exam		
WEEK 6 Class 10 MON 2/11	Political context for climate science, process for international assessments, and progress toward mitigation goals	Ebi	Luber/Lemery Text Chapter 19: Mitigation: International Institutions and Global Governance Luber/Lemery Text Chapter 17: International Perspective on Climate Change Adaptation
WEEK 6 Class 11 WED 2/13	Thermal extremes and their health impacts	Ebi	Luber/Lemery Text Chapter 3: Extreme and Changing Meteorological Conditions on the Human Health Condition
WEEK 7 MON 2/18	President's Day		
WEEK 7 Class 12 WED 2/20	Extreme weather and climate events and their health impacts	Ebi	Annual Disaster Statistical Review (CRED)
WEEK 8 Class 13 MON 2/25	Food security	Ebi	Luber/Lemery Text Chapter 9: Addressing the Challenges of Climate Change to Food Security, Safety, and Nutrition
WEEK 8 Class 14 WED 2/27	Air quality, including aeroallergens, and health	Ebi	Luber/Lemery Text Chapter 5: Ozone, Oppressive Air Masses, and Degraded Air Quality

WEEK 9 Class 15 MON 3/4	Vectorborne diseases	Morin	Luber/Lemery Text Chapter 8: Climate and Its Impacts on Vector-Borne and Zoonotic Diseases
WEEK 9 Class 16 WED 3/6	Other climate-sensitive health outcomes, including migration and displacement	Ebi (panopto)	
WEEK 10 Class 17 MON 3/11	Mitigation and health co-benefits	Hess	Luber/Lemery Text Chapter 18: Health Cobenefits of Climate Mitigation Strategies
WEEK 10 Class 18 WED 3/13	TBD based on student interest		
	Final Exam		