SYLLABUS

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

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Office hours: 9am-10am Mondays & Wednesdays before class inside the classroom or at tables directly outside of classroom, or by appointment.

Telephone number: (206) 543-6342

Course description

The world has entered the Anthropocene epoch. Humans are the primary drivers of global environmental changes and 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.

To address these, the United Nations Sustainable Development Goals (SDGs) were agreed in 2015 to achieve a better and more sustainable future for all. They include 17 global goals with targets for 2030. The SDGs aim to end all forms of poverty. The SDGs are unique in that they call for action by all countries, poor, rich, and middle-income to promote prosperity while protecting the planet. They recognize that ending poverty must go hand-in-hand with strategies that build economic growth and address a range of social needs including education, health, social protection, and job opportunities, while tackling climate change and environmental protection.

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 prepare for, attend, and participate in class discussions, demonstrate knowledge of assigned readings, and demonstrate teamwork/professionalism. 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)

Grades

- **30%** midterm exam
- **30%** final exam
- **30%** paper
- **10%** reading questions

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

The textbook can be accessed online for **free** through the UW library. To access go to the following link and use your UW NetID. If you have trouble accessing the textbook, please let the TA's know.

Textbook (online version): https://alliance-primo.hosted.exlibrisgroup.com/primo-explore/fulldisplay?docid=CP51261888670001451&context=L&vid=UW&lang=en_US&search_scope=all&adaptor=Local%20Search%20Engine&tab=default_tab&query=any,contains,Global%20Climate%20Change%20and%20Human%20Health:%20From%20Science%20to%20Practice

Reading questions. Reading assignments will be given nearly every week. These readings will supplement the lectures, as well as be a source for in-class discussion. The majority of these readings will come from the textbook (Luber), while others will come from other sources and be provided on the canvas page. To facilitate discussion and contribute to your grade, you will be asked to submit two questions or comments on each reading by Midnight the day before class. Questions or comments will be submitted through the Canvas discussion page, which will close by Midnight the day before class. **No late submissions will be accepted.** You will be allowed to miss two reading questions submissions and still receive full credit.

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, short answer, and essay 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, short answer, and essay 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 grading rubric will be provided for the paper. A one-paragraph summary and outline of the topic for the individual paper will be due one week after the mid-term exam on **Wednesday, February 5**. The paper will be due at the start of class on **Monday, March 9**. Please include your name in the file name.

Extra Credit. Students may receive extra credit for attending events throughout the quarter relevant to the course materials. **Up to 3 events** can be attended for credit. Following each event, students must submit a short, 1-page essay describing the event, and reflecting on takeaways.

UW Writing and Research Center. The Odegaard Writing & Research Center (OWRC) offers free, one-to-one, 45-minute tutoring sessions for undergraduate, graduate, and professional writers in all fields at the UW. We will work with writers on any writing or research project, as well as personal projects such as applications or personal statements. Our tutors and librarians collaborate with writers at any stage of the writing and research process, from brainstorming and identifying sources to drafting and making final revisions. For more information or to schedule an appointment, please see our website (http://depts.washington.edu/owrc), or come visit us in person on the first floor of Odegaard Undergraduate Library.

Microsoft Word. It is beneficial in this course for students to have access to Microsoft Word. The Microsoft Office suite is available for free to all UW students and can be downloaded from this

online site (https://itconnect.uw.edu/wares/uware/microsoft/microsoft-software-for-students/). If you have additional questions, please contact the TA's.

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.

Religious accommodation statement

Washington state law requires that UW develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The UW's policy, including more information about how to request an accommodation, is available at Religious Accommodations Policy (https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/). Accommodations must be requested within the first two weeks of this course using the Religious Accommodations Request form (https://registrar.washington.edu/students/religious-accommodations-request/)

Email policy

Emails received after 5 pm will be answered within 24 hours whenever possible, and not before 9 am the following morning.

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 1/6	Welcome to the Anthropocene: an introduction	Ebi	No reading assignments
WEEK 1 Class 2 WED 1/8	A success story: stratospheric ozone depletion and public health	Ebi	• http://www.ucsusa.org/global_warming/science_and_impacts/science/ozone-hole-and-gw-faq.html#.VsV2NfIrIU0 • https://www.youtube.com/watch?v=lBu3vltczRw
WEEK 2 Class 3 MON 1/13	Weather, climate, climate variability, and climate change	Bumbaco	Luber/Lemery Text Chapter 1: Primer on Climate Science
WEEK 2 Class 4 WED 1/15	Health risks of biodiversity loss	Hess	• 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 1/20	***Martin Luther King Day***		
WEEK 3 Class 5 WED 1/22	Health exposures: weather, climate variability, climate change, and climate change epidemiology	Ebi	McMichael AJ. 2001. Global environmental change as "risk factor": can epidemiology cope? AJPH 91:1172-1175

			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 6 MON 1/27	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 4 Class 7 WED 1/29	International agreements and progress toward adaptation and mitigation goals	Boyer	Luber/Lemery Text Chapter 19: Mitigation: International Institutions and Global Governance Luber/Lemery Text Chapter 17: International Perspective on Climate Change Adaptation
WEEK 5 Class 8 MON 2/3	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 2/5	**MIDTERM EXAM**		
WEEK 6 Class 10 MON 2/10	Extreme weather and climate events and their health impacts	Ebi	Luber/Lemery Text Chapter 3: Extreme and Changing Meteorological Conditions on the Human Health Condition Annual Disaster Statistical Review (CRED)
WEEK 6 Class 11 WED 2/12	Air quality, including aeroallergens, and health	Ebi	Luber/Lemery Text Chapter 5: Ozone, Oppressive Air Masses, and Degraded Air Quality
WEEK 7 MON 2/17	***President's Day***		
WEEK 7 Class 12 WED 2/19	Vectorborne diseases	Morin	Luber/Lemery Text Chapter 8: Climate and Its Impacts on Vector-Borne and Zoonotic Diseases
WEEK 8 Class 13 MON 2/24	Food security	Ebi	Luber/Lemery Text Chapter 9: Addressing the Challenges of Climate Change to Food Security, Safety, and Nutrition
WEEK 8 Class 14	Other climate-sensitive health	Ebi	Reading assignments: TBD

WED 2/26	outcomes, including migration and displacement		
WEEK 9 Class 15 MON 3/2	Mitigation and health co-benefits	Ebi	Luber/Lemery Text Chapter 18: Health Cobenefits of Climate Mitigation Strategies
WEEK 9 Class 16 WED 3/4	Sustainable Development Goals	Ebi	Reading assignments: TBD
WEEK 10 Class 17 MON 3/9	**PAPER DUE** Changes in our land and oceans	Ebi	No reading assignments
WEEK 10 Class 18 WED 3/11	Course review and preparation for final exam	Ebi	
	FINAL EXAM		