

# **ENVIRON/GLHLTH 320: Planetary Health: Ecosystems, Human Health and Policy**

**Fall 2020 Course Syllabus**

**Synchronous meeting time: Wednesday, 10:15-11:30**

## **Course Instructor:**

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My research [page](#)  
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## **Course Overview**

### **Description:**

Rapid advancements in science, technology and economic development over the past 100 years have created conditions for better health for billions of people on the planet. Yet there is growing evidence that these advancements have taken a heavy toll on the planet's ecosystems. Environmental damage from climate change, pollution, loss of species and other impacts threatens our food and water sources, the air we breathe and our exposure to infectious and noninfectious diseases. Planetary health is a new, interdisciplinary field focused on the interplay of human activity, changes in climate and ecosystems, and the resulting impacts on human well-being. After reviewing the major economic, social and political drivers of environmental change and the health consequences of these changes, we will consider which communities and populations are most vulnerable to disruptions of natural systems. We will examine frameworks for developing evidence-based policy interventions and consider the challenges of implementing successful policies for reducing environmental degradation and improving public health.

### **Learning Objectives:**

This course will provide an overview of planetary health and ways to think critically about its concepts, insights and policy implications. By the end of the course, students will be able to do the following:

1. Articulate the concept of planetary health and its distinguishing characteristics
2. Describe the major drivers and health impacts of climate and ecosystem changes
3. Understand the key methodological challenges of planetary health research

4. Identify groups most vulnerable to changes in the planet's ecosystems
5. Describe policy frameworks and alternative interventions

**Course Format:**

The course will include a combination of pre-recorded lectures, videos, readings, active discussion, student presentations, and small group work. We will have one 75 minute live, synchronous session each week that will include short presentations, conversations with experts in the field, and break out group discussions. These sessions will be recorded on Zoom and posted in Sakai. In addition, several pre-recorded lectures will be posted each week, and these should be viewed before the time when we all meet together. Class participation is an essential part of the learning process.

**Course Assignments and Grading****Exams:**

There will be two take home exams during the semester that will cover lectures, discussions, readings and other course material.

**Reflection Assignments:**

You will complete two reflection assignments during the semester to connect course materials with current research, news or policy related to planetary health. You will base each essay (400-600 words) on an article you select from a reputable news source. You will provide a synopsis of the article, link it to course material, and offer your own reflections. You will upload the assignment to the assignments tab of Sakai.

**Mini-case study:**

You will prepare a mini-case study on a planetary health issue for a particular geographic region. This will be done as a group project, and the case study will be presented in class. Your slide set and accompanying written report (800-1000 words) will cover the following:

- Describe a particular type of environmental change in a specific geographical region. Discuss its scope and rate of change, and any relevant historical, social, and economic drivers.
- Identify a specific human health outcome (or suite of health outcomes) expected to arise from this type of environmental change, and cite available evidence on the environment-health linkages.
- Identify any health inequities or vulnerable populations associated with these outcomes
- Describe a potential policy intervention to address the issue.

**Class participation:**

Please be prepared each week to discuss the readings, to analyze the key issues addressed, and to think creatively about applications. You will be graded on the quality of your participation, engagement and courtesy to others in class, ideas and comments, and reasoned analysis. There

will also be opportunities to engage in online discussion forums.

Your participation grade, which accounts for 20% of the total, will be based on 20 points allocated as follows:

- synchronous participation (chats, breakout groups, reporting back) 10 points
- asynchronous participation in online discussion forums 6 points
- office hours, emails 2 points
- completion of short assessments and other activities 2 points

For full points on synchronous participation, the above activities should occur in 10 out of 12 classes (first week excluded). If you are unable to participate in at least 10 sessions and you notify Randy in advance, an alternative participation mode will be made available. This would be an opportunity for written responses that follow the discussion themes in the synchronous sessions you miss.

### **Grading:**

Your course grade will be determined as follows:

Participation	20%
Reflections	20%
Case study	20%
Exam 1	20%
Exam 2	20%

Without prior permission from the instructor, late assignment grades will be reduced 10% for each day they are late. Grading scale: A+: 98-100, A: 94-97, A-: 90-93, B+ 87-89, B: 83-86, B-: 80-82, C+: 77-79, C: 73-76, C-: 70-72, D+: 67-69, D: 63-66, D-: 60-62, F: 59 and below.

### **Due Dates:**

Aug 28	Forum 1 posting and responses
Sep 4	Reflection assignment 1
Sep 16	Student presentation of mini case study topics
Sept 25	First exam
Oct 2	Forum 2 posting and responses
Oct 9	Submit outline for mini case study
Oct 16	Reflection assignment 2
Oct 23	Submit draft slides for mini case study
Oct 30	Second exam
Nov 4	Student presentation of mini case studies
Nov 11	Student presentation of mini case studies
Nov 13	Mini case write ups due

Except for in class presentations, all assignments are due by 6 pm on date indicated.

**Readings:**

The textbook for the course is Cole, J. [ed]. (2019). *Planetary Health: Human health in an era of global environmental change*. CABI. The book is available at the bookstore and through e-reserves. Additional articles from the popular press and scientific literature will be available on Sakai and should be read prior to the relevant class period.

**Course Sakai Site:**

Course readings, prerecorded lectures, announcements and other information are available on the Sakai course page. *You are responsible for checking the Sakai site several times per week.* For technical help with Sakai or Zoom, contact the Duke OIT Service Desk at <https://oit.duke.edu/help/> or 919-684-2200. You can also access the self-service help documentation for Zoom [here](#) and for Sakai [here](#). The ARC (Academic Resource Center) has a student-friendly learning online guide and Zoom instructions [here](#). Look on the sidebar on the left.

**Course Environment****Respect for Diversity Statement:**

It is my intent that students from all diverse backgrounds and perspectives be well-served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that the students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity: gender identity, sexuality, disability, age, socioeconomic status, ethnicity, race, nationality, religion, and culture. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally, or for other students or student groups. You are welcome to use this anonymous survey [link](#).

**Access and Accommodations:**

Your experience in this class is important to me. If you have a disability that may require accommodations in this class, please contact me as soon as possible to ensure that such accommodations are implemented in a timely fashion. You should also contact the [Student Disability Access Office](#).

In addition to accessibility issues experienced during the typical academic year, I recognize that remote learning may present additional challenges. Students may be experiencing unreliable wi-fi, lack of access to quiet study spaces, varied time-zones, or additional responsibilities while studying at home. If you are experiencing these or other difficulties, please contact me to discuss possible accommodations.

**Discussion Guidelines:**

Civility is an essential ingredient for academic discourse. All communications for this course should be conducted constructively, civilly, and respectfully. Differences in beliefs, opinions, and approaches are to be expected. Please bring any communications you believe to be in

violation of this class policy to the attention of your instructor. Active interaction with peers and your instructor is essential to success in this course, paying particular attention to the following:

- Be respectful of others and their opinions, valuing diversity in backgrounds, abilities, and experiences.
- Challenging the ideas held by others is an integral aspect of critical thinking and the academic process. Please word your responses carefully, and recognize that others are expected to challenge your ideas. A positive atmosphere of healthy debate is encouraged.

### **Academic Resource Center:**

The Academic Resource Center (ARC) offers free services to all students during their undergraduate careers at Duke. Services include Learning Consultations, Peer Tutoring and Study Groups, ADHD/LD Coaching, Outreach Workshops, and more. Because learning is a process unique to every individual, we work with each student to discover and develop their own academic strategy for success at Duke. Undergraduates in any year, studying any discipline can benefit. Contact the ARC to schedule an appointment: [arc.duke.edu](http://arc.duke.edu) • [theARC@duke.edu](mailto:theARC@duke.edu) • 919-684-5917.

### **Mental Health and Wellness Resources**

If your mental health concerns and/or stressful events negatively affect your daily emotional state, academic performance, or ability to participate in your daily activities, many resources are available.

- [DukeReach](#). Provides comprehensive outreach services to identify and support students in managing all aspects of wellbeing. They have recently expanded their drop-in hours.
- [Counseling and Psychological Services \(CAPS\)](#). CAPS services include individual, group, and couples counseling services, health coaching, psychiatric services, and workshops and discussions. (919) 660-1000
- **Blue Devils Care**. A convenient and cost-effective way for Duke students to receive 24/7 mental health support through [TalkNow](#).

Managing daily stress and self-care are also important to well-being. Duke offers several resources for students to both seek assistance on coursework and improve overall wellness. Please visit [DuWell](#) to learn more.

### **Academic Integrity:**

Duke University is a community dedicated to scholarship, leadership, and service and to the principles of honesty, fairness, respect, and accountability. Citizens of this community commit to reflect upon and uphold these principles in all academic and nonacademic endeavors, and to protect and promote a culture of integrity.

To uphold the Duke Community Standard:

- I will not lie, cheat, or steal in my academic endeavors;

- I will conduct myself responsibly in all my endeavors; and
- I will act if the Standard is compromised.

## **Course Schedule and Readings**

### **Module 1: What is planetary health? (Aug 19)**

*What are its origins? How does it compare with One Health, Ecohealth, and global health?*

Textbook, ch. 1-2

Horton, R., & Lo, S. (2015). Planetary health: a new science for exceptional action. *The Lancet*, 386(10007), 1921-1922.

Whitmee, S., Haines, A., Beyrer, C., Boltz, F., Capon, A. G., de Souza Dias, B. F., ... & Horton, R. (2015). Safeguarding human health in the Anthropocene epoch: report of The Rockefeller Foundation–Lancet Commission on planetary health. *The Lancet*, 386 (10007), 1973-2028 (*read executive summary; introduction, conclusion; skim rest of report*).

Ramirez, R (2020, June 16). *Black environmentalists are organizing to save the planet from injustice*. *Grist*, Retrieved from <https://grist.org/justice/theyre-back-black-environmentalists-are-rising-to-save-the-planet-from-injustice/>

### **Module 2: Conceptual frameworks for planetary health (Aug 26)**

*Ecological, philosophical and natural capital frameworks*

Textbook, ch. 3-5

Bateman, I., & Wheeler, B. W. (2018). Bringing Health and the Environment into Decision-Making: The Natural Capital Approach, Rockefeller Foundation Economic Council on Planetary Health, Oxford Martin School, University of Oxford.

Seltenrich, N. (2018). Down to earth: the emerging field of planetary health. *Environmental Health Perspectives*, 126 (7).

### **Module 3: Drivers of global environmental change (Sep 2)**

*Demographic trends, changing lifestyles, economic growth*

Textbook, ch. 7-10

Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M., ... & Folke, C. (2015). Planetary boundaries: Guiding human development on a changing planet. *Science*, 347(6223).

#### **Module 4: Research tools for empirical studies of planetary health (Sep 9)**

*Impact analysis, implementation science, benefit-cost analysis*

Riddell, V. (2016). Need for more and better implementation science in global health. *BMJ Global Health*, 1(2).

Pattanayak, S. K., Kramer, R. A., & Vincent, J. R. (2017). Ecosystem change and human health: implementation economics and policy. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 372(1722), 20160130.

Tan-Soo, J. S., & Pattanayak, S. K. (2019). Seeking natural capital projects: Forest fires, haze, and early-life exposure in Indonesia. *Proceedings of the National Academy of Sciences*, 116(12), 5239-5245.

#### **Module 5: Environmental justice, health equity, and global environmental change (Sep 16)**

*How can society protect vulnerable populations from ecosystem changes?*

Textbook, ch. 15

Wing, S., Horton, R. A., Muhammad, N., Grant, G. R., Tajik, M., & Thu, K. (2008). Integrating epidemiology, education, and organizing for environmental justice: community health effects of industrial hog operations. *American journal of public health*, 98(8), 1390-1397.

Gardiner, B. (2020, June 9). Unequal impact: The deep links between racism and climate change. *YaleEnvironment360*. Retrieved from <https://e360.yale.edu/features/unequal-impact-the-deep-links-between-inequality-and-climate-change>

#### **Module 6: Climate change and human health (Sep 23, 30)**

*Infectious disease, non-communicable disease, and mental health impacts*

Textbook, ch 13 and 16

Haines, A., & Ebi, K. (2019). The imperative for climate action to protect health. *New England Journal of Medicine*, 380(3), 263-273.

Carleton, T. A. (2017). Crop-damaging temperatures increase suicide rates in India. *Proceedings of the National Academy of Sciences*, 114(33), 8746-8751.

Figueres, C., Landrigan, P. J., & Fuller, R. (2018). Tackling air pollution, climate change, and NCDs: time to pull together. *The Lancet*. 392: 1502-1503

#### **Module 7: Biodiversity losses and human health (Oct 7, 14)**

*Nature's protective services: flood protection, mental health support, pandemic prevention*

Textbook, chapter 18

Das, S., & Vincent, J. R. (2009). Mangroves protected villages and reduced death toll during Indian super cyclone. *Proceedings of the National Academy of Sciences*. 06(18), 7357-7360.

Bratman, G. N., Anderson, C. B., Berman, M. G., Cochran, B., de Vries, S., Flanders, J., . . . Daily, G. C. (2019). Nature and mental health: An ecosystem service perspective. *Science advances*, 5(7).

Dasgupta, P & Andersen, I. (2020, June 5). Coronavirus shows we must change our economy to recognize that human wealth depends on nature's health. *The Independent*. Retrieved from <https://www.independent.co.uk/news/business/analysis-and-features/biodiversity-economy-coronavirus-covid-19-dasgupta-review-a9550156.html>

Dobson, A., Pimm, S., Hannah, L., Kaufman, L., Ahumada, J. A., Ando, A. W., ... & Vale, M.M. (2020). Ecology and economics for pandemic prevention. *Science*, 369(6502), 379.

### **Module 8: Food security and malnutrition (Oct 21, 28)**

*How to feed a hungry planet? Sustainable food systems, healthy diets and ending hunger*

Textbook, ch. 11

Schipanski, Meagan E., Graham K. MacDonald, Steven Rosenzweig, M. Jahi Chappell, Elena M. Bennett, Rachel Bezner Kerr, Jennifer Blesh et al. (2016). Realizing resilient food systems. *BioScience* 66 (7): 600-610.

Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S., ... & Jonell, M. (2019). Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. *The Lancet*, 393(10170), 447-492. (*read executive summary, introduction, conclusion; skim rest of report*).

Duff H., Faerron Guzmán, C., Almada, A., Golden, C., and Myers, S. (2020). Today's Solutions for the Future of Food. Planetary Health Case Studies: An Anthology of Solutions. <https://doi.org/10.5822/phanth9678> 7

### **Module 9: Student Presentations and course wrap-up (Nov 4, 11)**