Pandemic and the Environment

Course Information

Course format, dates and meeting times: June 28-July 23. Hybrid - Synchronous Remote Mondays and Wednesdays 8:30-10:35a.m. and asynchronous content, assessments and interactions (~50% each).
Instructor: Kate E. Miller, PhD, kmiller02@wesleyan.edu
Text/Readings: All readings will be provided online or will be from independent research (recent journal and press articles, book excerpts).
Materials: reliable computer and WiFi, Word and PowerPoint programs (or equivalent) and access to the Wesleyan Library online.

Course Description

The Covid-19 pandemic is a global disturbance with important environmental causes, effects and interactions. We will explore four key topics, evaluating what occurred and implications for future policy and practice. ***Wildlife:*** SARS-CoV-2 is a zoonotic disease, facilitated by "bush meat" markets and development of habitat that bring wildlife in close proximity to each other and humans. Stay-at-home orders, and temporary abandonment of human spaces released wildlife from constraints, while exposing the nature of our interdependence. ***Air pollution:*** Rates of hospitalization and mortality are greatest for those living with chronically high levels of air pollution, particularly PM <2.5. Factory and energy plant shut-downs sharply reduced those levels, highlighting the extent to which serious air pollution, and the disease and mortality it causes, has become acceptable. ***Environmental policy:*** As the crisis of the pandemic took center stage, numerous world leaders were emboldened to weaken, underfund, or attempt to eliminate environmental protections requiring corporate responsibility. ***Human environmental behavior:*** The public's behavior was altered by government recommendations and orders, as well as concern and fear, and continues to evolve with regard to use and value of open space and perceptions of high-density situations such as mass transit.

We will examine these themes through readings, discussion and other activities and various projects. Readings will include assigned journal and news articles and book excerpts and as well as resources found independently by students. In addition to reading for information and perspective, we will apply our understanding of scientific process and consider the source of data, context, purpose and audience. Students are expected to read all material prior to synchronous class meetings, in order to be able to discuss and apply the information.

There are two class periods per week that will consist of a combination of lecture, reading discussion, activities and group work. **Asynchronous content** will primarily consist of readings, along with short PowerPoints or recorded lectures and videos. **Additional work outside of class will include** Discussions (via Discussion Board), readings, assessments and group work on a presentation.

There are two group projects, a presentation and a paper. You will be expected to meet at least once with me regarding the topic, process, organization etc.

This is an intensive, 4-week, summer course. As such you will need to dedicate significant time to reading and preparation, including prior to our first class, and interactions, assessments and other work outside of class. The University recommends that you budget approximately three out-of-class hours for every class hour to complete the assigned work. Please be prepared to fit a full three-month semester into a single month!

Upon completion of the course students should be able to:

- Describe fundamental aspects of the Covid-19 pandemic including the nature of the virus, general timeline and various voluntary and mandated actions.
- Explain what a zoonotic infectious disease is, and identify the potential effects of various human activities on their development and spread.
- Discuss various human interactions with wildlife that were revealed by pandemic related changes to human activity.
- Identify key air pollutants resulting from activities curtailed during the pandemic, and their impacts on human health and Covid-19 infection and severity.
- Differentiate perceptions of disease risk from different sources (e.g., infectious disease vs. chronic exposure to air contaminants).
- Recount successful or attempted changes to environmental policy that took place during the pandemic, and consider their likely motivation, impact and potential to persist.
- Describe various changes to environmental behavior and evaluate the actual and potential persistence and impacts.
- Analyze findings presented in readings, critique findings and process, and discern context, including source, voice and audience.
- Collaborate and create a clear and engaging presentation on research questions.
- Plan and compose a group paper communicating to ensure coherent flow of information, clear intent and goals, and well-crafted narrative.
- Reflect on the course content and make connections to personal, academic and professional life.

Readings

The Covid-19 Pandemic

Jeannette Guarner, MD, Three Emerging Coronaviruses in Two Decades: The Story of SARS, MERS, and Now COVID-19, *American Journal of Clinical Pathology*, Volume 153, Issue 4, April 2020, Pages 420–421, https://doi.org/10.1093/ajcp/aqaa029

Wildlife

Amid the world's strictest lockdown, people who feed stray dogs are now deemed essential. (n.d.). Retrieved May 23, 2020, from https://www.nationalgeographic.com/animals/2020/05/worlds-strictest-

lockdown-people-feed-stray-dogs-essential/

Animals and cars: One million animals are killed on our roads every day. (n.d.). Psychology Today. Retrieved May 25, 2020, from http://www.psychologytoday.com/blog/animal-emotions/201007/animals-and-cars-one-million-animals-are-killed-our-roads-every-day

As coronavirus sends humans indoors, wild animals take back what was once theirs. (n.d.). Retrieved May 22, 2020, from https://www.inquirer.com/health/coronavirus/coronavirus-covid-19-wildlife-impact-social-distancing-20200415.html

Bouquet, E. (2020). In Light of COVID-19, China Institutes a Wild Animal Consumption Ban that has Skeptics Criticizing Efficacy. *International Enforcement Law Reporter*, *36*(4), 127–128.

D.C.-Area Wildlife Is Thriving While Humans Are Stuck Inside. (n.d.). NPR.Org. Retrieved May 25, 2020, from https://www.npr.org/local/305/2020/05/07/852083400/d-c-area-wildlife-is-thriving-while-humans-are-stuck-inside

Franklin, A. B., & Bevins, S. N. (2020). Spillover of SARS-CoV-2 into novel wild hosts in North America: A conceptual model for perpetuation of the pathogen. *Science of the Total Environment*, *733*. https://doi.org/10.1016/j.scitotenv.2020.139358

Measuring noise reduction in the ocean during the pandemic. (n.d.). Retrieved May 31, 2020, from https://phys.org/news/2020-05-noise-reduction-ocean-pandemic.html

Voigt, Christian C. and Kingston, Tigga. Bats in the Anthropocene: Conservation of Bats in a Changing World. 2016. Springer Open.

Moore, L. (n.d.). Reports of UK roadkill down two-thirds – but will hedgehogs thrive after lockdown? The Conversation. Retrieved May 25, 2020, from http://theconversation.com/reports-of-uk-roadkill-down-two-thirds-but-will-hedgehogs-thrive-after-lockdown-137645

Air pollution

Cadotte, M. (2020). Early evidence that COVID-19 government policies reduce urban air pollution [Preprint]. EarthArXiv. https://doi.org/10.31223/osf.io/nhgj3

Cicala, S., Holland, S. P., Mansur, E. T., Muller, N. Z., & Yates, A. J. (2020). Expected Health Effects of Reduced Air Pollution from COVID-19 Social Distancing (Working Paper No. 27135; Working Paper Series). National Bureau of Economic Research. https://doi.org/10.3386/w27135

Goldberg, M., & Villeneuve, P. (n.d.). *Air pollution, COVID-19 and death: The perils of bypassing peer review*. The Conversation. Retrieved May 24, 2020, from http://theconversation.com/air-pollution-covid-19-and-death-the-perils-of-bypassing-peer-review-136376

Goodkind, A. L., Tessum, C. W., Coggins, J. S., Hill, J. D., & Marshall, J. D. (2019). Fine-scale damage estimates of particulate matter air pollution reveal opportunities for location-specific mitigation of emissions. *Proceedings of the National Academy of Sciences*, *116*(18), 8775–8780. https://doi.org/10.1073/pnas.1816102116

Vehicles, Air Pollution & Human Health | Union of Concerned Scientists. (n.d.). Retrieved May 27, 2020, from https://www.ucsusa.org/resources/vehicles-air-pollution-human-health

Wang, P., Chen, K., Zhu, S., Wang, P., & Zhang, H. (2020). Severe air pollution events not avoided by reduced anthropogenic activities during COVID-19 outbreak. Resources, Conservation and Recycling, 158, 104814. https://doi.org/10.1016/j.resconrec.2020.104814

Wu, X., Nethery, R. C., Sabath, B. M., Braun, D., & Dominici, F. (2020). Exposure to air pollution and COVID-19 mortality in the United States: A nationwide cross-sectional study [Preprint]. Epidemiology.

https://doi.org/10.1101/2020.04.05.20054502

Environmental Policy

Ch, V., rashekhar, May. 7, 2020, & Pm, 1:15. (2020, May 7). *India's push to relax environmental assessment rules amid pandemic draws criticism*. Science | AAAS. https://www.sciencemag.org/news/2020/05/india-s-push-relax-environmental-assessment-rules-amid-pandemic-draws-criticism

COVID-19: Implications for Environmental Permitting and Compliance. (n.d.). Osler, Hoskin & Harcourt LLP. Retrieved May 23, 2020, from http://www.osler.com/en/resources/regulations/2020/covid-19-implications-for-environmental-permitting-and-compliance

McKibben, B. (n.d.). *In the Midst of the Coronavirus Pandemic, Construction Is Set to Resume on the Keystone Pipeline*. The New Yorker. Retrieved May 28, 2020, from https://www.newyorker.com/news/daily-comment/in-the-midst-of-the-coronavirus-pandemic-construction-is-set-to-resume-on-the-keystone-pipeline

New EPA Rules Will Increase Air Pollution As The World Suffers A Respiratory Pandemic. (n.d.). Retrieved May 23, 2020, from https://www.wbur.org/earthwhile/2020/04/02/new-epa-rules-will-increase-air-pollution-as-the-world-suffers-a-respiratory-pandemic

States sue Trump administration over rollback of Obama-era water protections | TheHill. (n.d.). Retrieved May 28, 2020, from https://thehill.com/policy/energy-environment/495699-states-sue-trump-administration-over-rollback-of-obama-era-water

States Sue Trump EPA for Suspending Environmental Regulations During Pandemic. (2020, May 15). EcoWatch. https://www.ecowatch.com/states-sue-trump-epa-suspending-regulations-coronavirus-2646004668.html

Times, S. (2020a, May 9). From India to Indonesia environmental laws are being relaxed. *Sustainability Times*. https://www.sustainability-times.com/environmental-protection/from-india-to-indonesia-environmental-laws-are-being-relaxed/

Environmental Behavior

Buck, J. C., & Weinstein, S. B. (2020). The ecological consequences of a pandemic. *Biology Letters*, *16*(11), 20200641. https://doi.org/10.1098/rsbl.2020.0641

Eisenmann, C., Nobis, C., Kolarova, V., Lenz, B., & Winkler, C. (2021). Transport mode use during the COVID-19 lockdown period in Germany: The car became more important, public transport lost ground. *Transport Policy*, *103*, 60–67. https://doi.org/10.1016/j.tranpol.2021.01.012

Heo, S., Lim, C. C., & Bell, M. L. (2020). Relationships between Local Green Space and Human Mobility Patterns during COVID-19 for Maryland and California, USA. *Sustainability*, *12*(22), 9401. https://doi.org/10.3390/su12229401

Laato, S., Islam, A. K. M. N., Farooq, A., & Dhir, A. (2020). Unusual purchasing behavior during the early stages of the COVID-19 pandemic: The stimulus-organism-response approach. *Journal of Retailing and Consumer Services*, *57*, 102224. https://doi.org/10.1016/j.jretconser.2020.102224

Labonté-LeMoyne, É., Chen, S.-L., Coursaris, C. K., Sénécal, S., & Léger, P.-M. (2020). The Unintended Consequences of COVID-19 Mitigation Measures on Mass Transit and Car Use. *Sustainability*, *12*(23), 9892. https://doi.org/10.3390/su12239892

Landry, C. E., Bergstrom, J., Salazar, J., & Turner, D. (2021). How Has the COVID-19 Pandemic Affected

Outdoor Recreation in the U.S.? A Revealed Preference Approach. *Applied Economic Perspectives and Policy*, *43*(1), 443–457. https://doi.org/10.1002/aepp.13119

Przybylowski, A., Stelmak, S., & Suchanek, M. (2021). Mobility Behaviour in View of the Impact of the COVID-19 Pandemic—Public Transport Users in Gdansk Case Study. *Sustainability*, *13*(1), 364. https://doi.org/10.3390/su13010364

Ugolini, F., Massetti, L., Calaza-Martínez, P., Cariñanos, P., Dobbs, C., Ostoić, S. K., Marin, A. M., Pearlmutter, D., Saaroni, H., Šaulienė, I., Simoneti, M., Verlič, A., Vuletić, D., & Sanesi, G. (2020). Effects of the COVID-19 pandemic on the use and perceptions of urban green space: An international exploratory study. *Urban Forestry & Urban Greening*, *56*, 126888. https://doi.org/10.1016/j.ufug.2020.126888

One Health

Cunningham, A. A., Daszak, P., & Wood, J. L. N. (2017). One Health, emerging infectious diseases and wildlife: Two decades of progress? *Philosophical Transactions of the Royal Society B: Biological Sciences*, *372*(1725), 20160167. https://doi.org/10.1098/rstb.2016.0167

Schedule of Topics

Week starting	Classes	Topics
6/28	Zoom Classes: 1, 6/28 2, 6/30	Introduction, Wildlife: • Course overview and introductions • Review of scientific process, and scientific and science writing • SARS-CoV-2 and Covid-19 profile • Zoonotic diseases: reservoirs and hosts, transmission, effects of human activity • "Wandering wildlife": consequences of removal of humans from wildlife interactions including revelations about dependence, and wildlife use of human space
7/5	Zoom Classes: 3, 7/5 4, 7/7	Wildlife concluded, Air Pollution: • Pandemic effects on wildlife policy and potential future policy changes • Air pollution primer (types and sources) • Reductions due to stay-at-home • Associations with disease including Covid-19 • Mortality rates during shut-downs, lessons learned • Implications for policy
7/12	5, 7/12 6, 7/13	Environmental Policy • Phenomena of undermining public participation and process during a crisis • Examples of changes to environmental policy in the United States and elsewhere • The impact of these policies on environmental protection, health and public participation • Persistence / reversal of crisis policy changes
7/19	7, 7/19 8, 7/21	Environmental Behavior, One Health • Documented changes to open/green space use • Challenges to safety and perceptions of high-density situations (e.g. mass transit) • Potential future responses and policies – what will we remember? • Integrated perspective on human health, "One Health", promise and challenges

Assessments

Assessment	Points	%
Quizzes	160	16%
Reading Responses	200	20%
Discussions	140	14%
Group Presentation	150	15%
Group Paper	150	15%
Reflection	100	10%
Participation	100	10%
TOTAL	1000	100%

Quizzes

There will be weekly online quizzes covering information fundamental to understanding biological or environmental aspects of the reading. They are multiple-choice and open-source, with no time limit, are posted in advance with multiple submissions possible to allow you to research the information. See the Course Moodle Calendar for exact due dates.

Reading Responses

Each week an article will be singled out for you to read, review and respond to questions regarding scientific process, content, implications, interpretation, connections, etc.

Discussions

Each week you will be asked to post responses to Discussion questions about that week's content and readings, and to reply thoughtfully and specifically to other students' posts.

Group Presentation

Working with other students you will tackle a specific question related to one week's topic, conducting research in peer-reviewed and popular press, and constructing and delivering an informative presentation during a class period.

Group Paper

Working with your presentation group you will provide a more detailed exploration of your topic in a fully written format, with in-text citations, and sections written individually by each student of the group.

Reflection

In a final written and video reflection you will respond to reflection questions that ask you to identify key themes in the material, and make connections to your own personal, academic and future professional live.

Participation

Participation will be graded based on attendance to all of each class (unless otherwise discussed), participation in class discussions and group work, and contribution to a productive and supportive learning environment. It will also reflect your timely participation in posted Discussions, and in group work outside of class. While this is extremely unlikely, please note that behavior that is disruptive as determined by the instructor may be addressed privately, and if unaltered, may result in a reduced participation grade or other actions.

Other information regarding assessments

Late Submission

Unless we have discussed the reasons and conditions of a late submission, only partial/no credit will be given. Please share privately any formal accommodations. It may be considered unethical to other students to change deadlines or assignment requirements for individual students without formal accommodations,

so please consider seeking those if you believe you have challenges that will make it difficult for you to participate fully and meet course requirements within the time constraints.

Writing

For all assignments the quality of your writing matters. Your writing needs to be grammatically correct, free of spelling errors, with well-constructed paragraphs and flow of information. Key attributes of science writing also include taking care to be concise, specific and accurate. As long as the writing is clear, you are welcome to explore and develop your own writing style. Feedback on assignments will be primarily with regard to content, not the quality of writing. If you struggle with your writing, please contact the Writing Workshop in advance to determine the availability and terms of assistance.

Class Culture, Interactions and Expectations

Instructor Access

You can contact me via the course Moodle or email; in addition, I am available to meet via Zoom. Given the different time zones of students, and the accelerated pace of the course I will not hold regular office hours except for directly after class when I will plan to remain on Zoom to meet with individual students and/or answer additional questions. If that time does not work, we will communicate to find a better time to meet. In most cases I will access email on a daily basis, however please be aware that there may be a gap between the time you send the email and the time I respond.

Zoom Etiquette

Approximately half our time will be spent in a synchronous, remote class allowing us to use technology to be present in the class together and do many of the things we would do if we were in-person. Here are some guidelines for attending and participating in class:

- Be ready with everything you need to join the class by 8:30 a.m. (notebook, readings, etc.).
- Plan to be present for the entire class. We will take a short break after approximately 1 hr.
- Plan to turn your camera on at the start of class, and leave it on for the entire class including during group work.
- Be aware of your microphone. Keep it off unless you're speaking or engaged in group work. Otherwise, the collective impact of background and incidental noises may make it difficult for everyone to hear.
- Use your full name on your Zoom account.
- Contact me if you will be coming late, leaving early, cannot attend class or cannot use audio or visual for all or part of the class.
- Have windows and applications not related to class closed during the entire class period. Keep in mind you may be asked / want to share your screen at some point.
- Please put away your cell phone during class (just as you would in person!), unless you have family or other obligations.
- I may record segments of our class; please be aware of your surroundings, and consider whether or not there is anything visible that may inadvertently cause offense to another student.

Other class etiquette

This is an early class, during the summer! We'll want to make the most of our time together. So please do what you need to in order to be on time, and be ready to fully engage. Feel free to bring a snack or beverage. Consider that your readiness and engagement can contribute to our class culture, and everyone's success.

My goal is to work with you to help foster a class culture that supports curiosity, sharing and exploration. You can contribute to that culture through respectful communications and peer support. If any of my classroom management or feedback, or interactions with another student/s, are impairing your ability to learn or are in any way upsetting (regardless of good intentions), please let me know privately so that I can seek a remedy.

In addition to the subject matter this course, like all college courses, is an opportunity to practice important skills such as communications, collaboration, and critical-thinking. Participation is an important part of your grade, and includes attendance as well as contributing to group work and asking / answering questions. We will likely be a relatively small group, and as well, a friendly one! If you are naturally reticent to speak up in front of others, I understand, but since this type of communication is part of a college course, it will be expected. Feel free to contact me to discuss strategies for speaking in public and navigating group activities.

What if I need academic accommodations?

Wesleyan University is committed to creating an inclusive and accessible learning environment consistent with the Americans with Disabilities Act. If you have approval for academic accommodations, please notify me at the start of the course. If you do not have approved accommodations, but have a disability requiring academic accommodations or have questions about accessibility and disability accommodations contact the Wesleyan Accessibility Office: North College Rm 021, accessibility@wesleyan.edu, 860-685-5581.

Intellectual Integrity / Honor Code

All students of Wesleyan University are responsible for knowing and adhering to the Honor Code of this institution. Violations of this policy may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council – Office of Student Affairs. Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). The Honor Code Office has more information.

Some assignments may be submitted to SafeAssign or another plagiarism-detecting system. Assignments can be stored in these systems to prevent being plagiarized from in the future, but student authors will remain anonymous. Assignments will also be analyzed for use of auto-paraphrasing sites. These sites produce results that have poor grammar, phrasing, and flow; therefore, points will be deducted for these items.

Discrimination and Harassment

Wesleyan University is committed to maintaining a positive learning, working, and living environment. Wesleyan will not tolerate acts of discrimination or harassment based upon Protected Classes or related retaliation against or by any employee or student. For purposes of this Wesleyan policy, "Protected Classes" refers to race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. Individuals who believe they have been discriminated against should contact the Office for Equity and Inclusion at 860-685-4771. The responsibility of the University Members has more information.