Remote Sensing for Environmental Health
ENV H 478/578

Winter 2025
University of Washington

Monday and Wednesday, 1:00-2:20 PM
3 credits, graded

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Communication
I will stay for a few minutes after the class, which meets twice a week, to answer any student questions or concerns. This is the best way to communicate with me. Second, I am available for a 15-minute appointment per person to have a deeper discussion; you may walk-in my office during this hour, but I recommend an appointment in advance to reduce your waiting time. The third-best option is via email, and I will do my best to respond within three business days. As a learning community, I encourage students to post questions on Canvas's Discussion board so that your peers can assist you.

Course Description
The physical properties (e.g., extreme temperature) and design (e.g., green space and housing) of urban environments can significantly influence human health. This course provides an overview of fundamental environmental characteristics, health issues, and how different sensors—optical, microwave, thermal, and night-light—capture these characteristics. Additionally, students will acquire hands-on skills in collecting, analyzing, and interpreting remote sensing data for environmental health applications. Course activities include lectures, readings, student-led discussions, and lab exercises. The course culminates in a group project where students investigate spatial inequality or changes in an environmental feature and discuss its implication for public health.

Course Learning Outcomes for 478 and 578
At the conclusion of the course, students should be able to:

1. Identify linkages between physical and mental health and the environmental features influenced by human activities.
2. Explain the suitability of remote sensing data (optical, thermal, radar, nighttime light) for environmental health studies, considering spatial and temporal resolutions.
3. Describe the workflow for using remote sensing methods to observe physical and social properties in urban environments to examine environmental health issues.
4. Examine spatial inequality or changes in environmental features using maps and statistics.
5. Interpret spatial patterns and trends of selected environmental features and discuss their health implications.
6. Discuss policy interventions to improve public health through environmental pathways.
7. Use Google Earth Engine for the collection and analysis of remote sensing data, and GIS for visualization.

Additional Learning Outcomes for 578

1. Synthesize literature to identify a scientific problem associated with environmental health.
2. Justify the accuracy of the methodological approach used in the final project.

Course Prerequisites

Any basic training in Geographic Information System (GIS), such as ENVH465/565 GIS in Public Health or URBDP404/504 Intro GIS is recommended. At least one laptop per group is required for Friday's lab sessions. The lab work will be based on Google Earth Engine (JavaScript). While prior experience in JavaScript is not required, any experience in coding would be helpful. GIS handles a form of data that has spatial attributes; Intro level GIS or other data science experience would be helpful.

Class content

Instruction will consist of two 80-minute sessions each week. The first session will include lecture, student presentations, and discussion; the second session will include a hands-on computer lab exercise and work on the final project. At least one laptop per group is required for the second session. Each week will examine a specific environmental health topic with lecture, discussion, and readings demonstrating the use of remote sensing for spatiotemporal problem solving. The same topic will be explored with a hands-on exercise, which will provide practical experience with using Google Earth Engine, R, and QGIS. The exercises and final project should be conducted in two-person teams to allow for peer-learning.

Evaluation

20% Reading reflections
15% Leading reading discussion
15% Lab exercise
20% Midterm proposal
30% Final project

Final project (group):

The final project is a research project using remote sensing to explore an environmental issue that has health implications. Options are offered to present results either for the media or for scientific publication.

Option 1: Write a media report focusing on storytelling and public communication (1200-1500 words), including identifying an environmental health related issue in a geographically defined region (e.g., the US, King County, etc.), using remote sensing data to present temporal change or spatial inequality of the environmental features, communicate the implications of these features for a health outcome(s) based on literature, and discuss policy suggestions. Target for submission to Seattle Times or other regional newspapers.

Media report rubric

Criteria	Evaluation	Grade 4 levels: Excellent Good Fair Tried
Context and Engagement	Does the piece use relevant context such as recent news, historical data, national/international benchmark, or story narratives to underscore the importance of the issue?	4pts
Clarity of Purpose	Is there a clearly defined question or objective that the piece aims to address? Does the designed approach precisely target this question or objective?	4pts
Source and Methodology Transparency	Does the piece clearly describe the remote sensing data source(s) and the methodology used to analyze environmental features? Are there explanations for those methodology choices using language that a general audience can understand?	4pts
Quality and Communication of Visuals	Are the visual aids, particularly maps, of high quality and highlight spatial inequalities or temporal changes? Do these visuals include essential elements like legends, scale bars, and legible text? Evaluate the extent to which these visuals aid in conveying the story or findings.	4pts
Quantitative Justification	Does the piece use relevant context such as recent news, historical data, national/international benchmark, or story narratives to underscore the importance of the issue?	4pts
Implications and Policy Advocacy	Is there a clearly defined question or objective that the piece aims to address? Does the designed approach precisely target this question or objective?	4pts

Option 2: Write a concise research paper (2,500-3,000 words) that focuses on empirical findings and scientific rigor, aimed at an audience of an environmental health journal, or a journal in your field that covers environmental health issues. The paper should be suitable for submission to a peer-reviewed journal.

Research paper rubric

Criteria	Evaluation	Grade 4 levels: Excellent Good Fair Tried
Style and format	The paper is organized into the following sections: Introduction, Methods, Results, Discussion, and References. Statements not derived from the results of this study are supported with citations. Include an Author Contribution Statement to disclose the division of work among the team members. Include an AI statement if tools of generative artificial intelligence (e.g., ChatGPT) was used in the production of the paper. Include Figure and Table captions.	2pts
Context and Engagement	Does the piece describe the issue's relevance based on literature in relevant fields (e.g., environmental health, sociology, urban planning) in the introduction?	3pts
Clarity of Purpose	Identify research gaps based on the literature to foreground the research question in the introduction. Justify the use of remote sensing for enhancing understanding of the topic over traditional methods. Is there a clear rationale for the defined question or objective that the piece aims to address?	4pts
Source and Methodology Transparency	Outline the scope of the research, including the environmental variables under study, study area, and times. Explain the selection rationale of the satellite data, including spectral properties, spatial and temporal resolution, and coverage period. Justify why the selected data is the best possible choice for this project among publicly available data.	4pts
Quality and Communication of Visuals	Are the visual aids, particularly maps, of high quality and highlight spatial inequalities or temporal changes? Do these visuals include essential elements like legends, scale bars, and legible text?	4pts
Quantitative Justification	Does the paper interpret quantitative statistics (classification, descriptive statistics, regression analysis etc.) to illustrate spatial disparities or changes in the environmental feature(s). Describe the accuracy and potential biases of results.	4pts
Implications and discussion	Discuss the study's findings in relation to existing literature, e.g., similarities, differences, and new insights gained. Address the implications of findings and offer suggestions for applying them to enhance public health.	3pts

Midterm proposal (group): Written paper + presentation + peer review. Present the research proposal for the final project as a group, including the background, proposed methods, and assessment of suitability of remote sensing data. Six minutes presentation + Q&A.

Peer review for midterm and final paper (individual): Each student will be assigned to review one midterm proposal and one final paper. Graded as complete or incomplete. A complete review should include an evaluation with evidence for each criterion of the rubric. If a critique is provided, a constructive suggestion alongside it is recommended.

Lab exercise reports (group):
The lab exercise reports should include written answers and figures (screenshots) to address the questions and should be submitted by group. Deadline for each of the four reports are shown in the class schedule below. Graded as complete or incomplete; a complete report should answer all questions, with half or more of the questions answered correctly. You will earn 5 points for each completed submission before deadline, until you earn 15 points over the quarter. That is, only one missing submission among the four lab reports will not affect your grade.

Reading reflections (individual): students should submit their reflections on the weekly reading on the Canvas's discussion board by the end of Friday. Graded as complete and incomplete. You will earn 3.5 points for each on-time completed submission, until you earn 20 points over the quarter. That is, only one missing submission among the seven reading submissions will not affect your grade. For each of the two weekly readings, the reflection should include:
- a point that you find interesting from the article, which can be regarding the methodology or the scientific finding. ~2 sentences.
- a question or a critique, such as the weakness of the method, a bias in the research design, or an alternative approach you would prefer to adopt for your own research. ~2 sentences.

Reading presentation and discussion (group): Each group should present an overview of one week's readings and lead discussion with other students once in the quarter. The presentation should be concise (~3 minutes) and the discussion lasts a total of 15-17 minutes. The discussion will be run by two break-out groups, with each member leading the discussion per small group. The discussion should include at least one authoritative question, which is based on the fact present in the paper and the purpose is to help participants digest the content of the reading, and at least one dialogic question, which is open to different points of view and the purpose is to encourage debate on an issue or understand various perspective that might arise when we engage in the reading materials. At least one question should come from peers' reflections posted on the Canvas discussion board.

Additional expectations for graduate students (578)
Graduate students will have one additional question on each reading reflection. They will also be required to include a literature review and an accuracy assessment in their final project, adding the following expectations to the rubric: (1) *Clarity of Purpose*: How clearly does the paper identify a research gap based on the literature synthesis? and (2) *Quantitative Justification*: Is the accuracy assessment implemented rigorously (including a suitable sampling approach, accuracy metrics, and interpretation of those metrics)

Late Policy
Reflections and lab reports are graded on a complete or incomplete basis, with late submissions not permitted. However, missing a single reflection or report will not impact your grade. The final project builds on the skills practiced in lab assignments, and includes a midterm proposal to ensure progress. I strongly recommend starting on your final project early to avoid last-minute

challenges preventing timely submission. In the event that you are unable submit midterm proposal or final paper on time, a late policy, 10% of the score deduction each day, will be enforced to ensure fairness to other students. I do recognize that some challenges are simply insurmountable, for example, physical or mental illness or a family emergency. If you foresee further accommodations needed, I encourage you to use the Disability Resources for Students (DRS) at disability.uw.edu.

Grade conversion

This table describes how numeric grades (out of 100) will convert to the 4.0 grade scale for the class.

Grade point	Minimum score
4	98
3.9	96.5
3.8	95
3.7	93.5
3.6	92
3.5	90.5
3.4	89
3.3	87.5
3.2	86
3.1	84.5
3	83
2.9	81.5
2.8	80
2.7	78.5
2.6	77
2.5	75.5
2.4	74
2.3	72.5
2.2	71
2.1	69.5
2	68
1.9	66.5
1.8	65

1.7	63.5
1.6	62
1.5	60
0	<60

Class schedule

Week	Topic	Lab
1	March 27 Introduction To Remote Sensing Applications for Environmental Health	March 29 Asynchronous – no scheduled class Go through the “Intro to Google Earth Engine” module before the next class
2	April 3 Built Environment and Health Optical Remote Sensing	April 5 Lab 1: Image compositing, band, indices, and export data *Submit group member’s names*
3	April 10 Urban Ecology and Human-animal Interface Remote Sensing Principles	April 12 Lab 1: Vector data summary
4	April 17 Climate Extreme Events and Environmental Hazards Radar Remote Sensing	April 19 Lab 2: Classification and accuracy assessment *Lab 1 report due before class*
5	April 24 Midterm Presentation	April 26 Midterm presentation *Lab 2 report due before class*
6	May 1 Heat Islands and Thermal Comfort Thermal Remote Sensing	May 3 Lab 3: Spatial pattern analysis

7	May 8 Time-series Analysis in Remote Sensing Nightlight Remote Sensing	May 10 Lab 4: Anomaly detection *Lab 3 report due before class*
8	May 15 Air Pollution and Wildfire Atmospheric Remote Sensing	May 17 Lab 4: Long-term trend analysis
9	May 22 Humanitarian Applications of Remote Sensing Ethical Practice of Remote Sensing	May 24 Work on the final project *Lab 4 report due before class*
10	May 29 Final Project Presentation Final Paper due before class	Asynchronous – no scheduled class Provide comments on the assigned peer papers by the end of May 31

Readings

- All course readings except textbook chapters are provided on Canvas under "Files".
- Textbook (optional): Cardille, J. A., Crowley, M. A., Saah, D., & Clinton, N. E. (Eds.). (2023). *Cloud-based remote sensing with google earth engine: fundamentals and applications*. Springer Nature. Free access.

Weekly readings before class

Week	Topic	Readings
1	March 27 Introduction to remote sensing applications for environmental health	Frumkin, H., & Haines, A. (2019). Global environmental change and noncommunicable disease risks. *Annual review of public health*, *40*, 261-282. Burke, M., Driscoll, A., Lobell, D. B., & Ermon, S. (2021). Using satellite imagery to understand and promote sustainable development. Science, 371(6535), eabe8628. No reflection submission for this week.

2	April 3 Built environment and health	Naik, N., Kominers, S. D., Raskar, R., Glaeser, E. L., & Hidalgo, C. A. (2017). Computer vision uncovers predictors of physical urban change. Proceedings of the National Academy of Sciences, 114(29), 7571-7576. Chen, T. H. K., Horsdal, H. T., Samuelsson, K., Closter, A. M., Davies, M., Barthel, S., … & Sabel, C. E. (2023). Higher depression risks in medium-than in high-density urban form across Denmark. Science Advances, 9(21), eadf3760.
3	April 10 Urban ecology and human-animal interface	Gibb, R., Colón-González, F. J., Lan, P. T., Huong, P. T., Nam, V. S., Duoc, V. T., ... & Lowe, R. (2023). Interactions between climate change, urban infrastructure and mobility are driving dengue emergence in Vietnam. *Nature communications*, *14*(1), 8179. Willis, M. D., Wesselink, A. K., Hystad, P., Pescador Jimenez, M., Coleman, C. M., Kirwa, K., ... & Wise, L. A. (2023). Associations between Residential Greenspace and Fecundability in a North American Preconception Cohort Study. Environmental Health Perspectives, 131(4), 047012. Optional: Li, X., Zhang, C., Li, W., Kuzovkina, Y. A., & Weiner, D. (2015). Who lives in greener neighborhoods? The distribution of street greenery and its association with residents' socioeconomic conditions in Hartford, Connecticut, USA. Urban Forestry & Urban Greening, 14(4), 751-759.
4	April 17 Climate extreme events and environmental hazards	Román, M. O., Stokes, E. C., Shrestha, R., Wang, Z., Schultz, L., Carlo, E. A. S., ... & Enenkel, M. (2019). Satellite-based assessment of electricity restoration efforts in Puerto Rico after Hurricane Maria. *PloS one*, *14*(6), e0218883. Chen, T. H. K., Kincey, M. E., Rosser, N. J., & Seto, K. C. (2024). Identifying recurrent and persistent landslides using satellite imagery and deep learning: A 30-year analysis of the Himalaya. Science of The Total Environment, 171161. Optional: Tellman, B., Sullivan, J. A., Kuhn, C., Kettner, A. J., Doyle, C. S., Brakenridge, G. R., ... & Slayback, D. A. (2021). Satellite imaging reveals increased proportion of population exposed to floods. *Nature*, *596*(7870), 80-86.
5	April 24 Midterm presentation	No reading
6	May 1 Heat islands and thermal comfort	Hsu, A., Sheriff, G., Chakraborty, T., & Manya, D. (2021). Disproportionate exposure to urban heat island intensity across major US cities. *Nature communications*, *12*(1), 2721. Massaro, E., Schifanella, R., Piccardo, M., Caporaso, L., Taubenböck, H., Cescatti, A., & Duveiller, G. (2023). Spatially-optimized urban greening for reduction of population exposure to land surface temperature extremes. Nature communications, 14(1), 2903.

7	May 8 Time-series Analysis in Remote Sensing	Taubenböck, H., Mast, J., Geiß, C., Wurm, M., Esch, T., & Seto, K. C. (2024). Global differences in urbanization dynamics from 1985 to 2015 and outlook considering IPCC climate scenarios. Cities, 151, 105117. Zhang, Y., Peng, N., Yang, S., & Jia, P. (2022). Associations between nighttime light and COVID-19 incidence and mortality in the United States. *International Journal of Applied Earth Observation and Geoinformation*, *112*, 102855.
8	May 15 Air pollution and wildfire	Safarianzengir, V., Sobhani, B., Yazdani, M. H., & Kianian, M. (2020). Monitoring, analysis and spatial and temporal zoning of air pollution (carbon monoxide) using Sentinel-5 satellite data for health management in Iran, located in the Middle East. *Air Quality, Atmosphere & Health*, *13*, 709-719. Casey, J. A., Kioumourtzoglou, M. A., Padula, A., González, D. J., Elser, H., Aguilera, R., ... & Benmarhnia, T. (2024). Measuring long-term exposure to wildfire PM2. 5 in California: Time-varying inequities in environmental burden. *Proceedings of the National Academy of Sciences*, *121*(8), e2306729121.
9	May 22 Refugee and humanitarian applications	Müller, M. F., Yoon, J., Gorelick, S. M., Avisse, N., & Tilmant, A. (2016). Impact of the Syrian refugee crisis on land use and transboundary freshwater resources. *Proceedings of the national academy of sciences*, *113*(52), 14932-14937. Bennett, M. M., Gleason, C. J., Tellman, B., Leon, L. F. A., Friedrich, H. K., Ovienmhada, U., & Mathews, A. J. (2024). Bringing satellites down to Earth: Six steps to more ethical remote sensing. *Global Environmental Change Advances*, *2*, 100003. Optional: Kuffer, M., Pfeffer, K., & Sliuzas, R. (2016). Slums from space—15 years of slum mapping using remote sensing. *Remote Sensing*, *8*(6), 455.
10	May 29 Final project presentation	No reading

Access and Accommodations
Your experience in this class is important to us. 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 have already established accommodations with Disability Resources for Students (DRS), please activate your accommodations via myDRS so we can discuss how they will be implemented in this course. If you have not yet established services through DRS but have a temporary health condition or permanent disability that requires accommodations (conditions include but not limited to: mental health, attention-related, learning, vision, hearing, physical or health impacts), contact DRS directly to set up an Access Plan. DRS facilitates the interactive process that establishes reasonable accommodations. Contact DRS at disability.uw.edu.

Religious Accommodations
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. Accommodations must be requested within the first two weeks of this course using the Religious Accommodations Request form.

Use of Generative Artificial Intelligence in Coursework
The school has provided instructors with the flexibility to develop their own policies for appropriate use of AI for student's coursework. I view AI as part of the evolution of tools that we can choose to be well-intentioned to improve science and communication. There are potential benefits of using AI tools (e.g., ChatGPT) for various purposes, including but not limited to troubleshooting coding issues, searching for functions or tools, exploring literature content, checking grammar errors, and improving writing. Students who choose to use generative AI tools for their assignments are fully responsible for the output of their work. This means they should verify the accuracy of the information and reflect potential errors, fake content, or biases generated by the AI tools. Users should also be aware that inputs to AI tools may be used for the company's future purposes. It is important to avoid misconduct, including the submission of copyrighted, confidential, or personally identifiable information to these AI tools, as it grants permission to the AI company for using these contents. Also note that the use of Chat-GPT and similar tools does not alleviate the need to cite sources and references in your writing. Provide a statement on components that AI was used if you choose to use AI tools for the final paper. Whether using AI or not will not affect the standard of grading.

Academic Integrity
Students at the UW are expected to maintain the highest standards of academic conduct, professional honesty, and personal integrity. UW is committed to upholding standards of academic integrity consistent with the academic and professional communities of which it is a part. Plagiarism, cheating, misuse of AI tools, and other misconduct are serious violations of the University of Washington Student Conduct Code (WAC 478-121). 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.

Land Acknowledgement
The University of Washington acknowledges the Coast Salish people of this land, the land which touches the shared waters of all tribes and bands within the Duwamish, Suquamish, Tulalip, and Muckleshoot nations.

Illness Protocol
If you feel ill or exhibit respiratory or other symptoms, you should not come to class. Seek medical attention if necessary and notify your instructor(s) as soon as possible by email. UW Environmental Health & Safety recommends that you wear a well-fitting mask while you are symptomatic
Additional recommendations include getting your annual flu shot and getting boosted with the updated COVID vaccines (available at clinics and pharmacies, as well as through UW Medicine and local health agencies).
Please check your email and CANVAS announcements daily BEFORE coming to class. If we need to conduct class remotely because the instructor or a guest speaker is unable to attend in person, we will send all registered students an email and/or post a CANVAS announcement with a Zoom link for remote instruction or a plan for making up the class.

Inclusion & Diversity
Diverse backgrounds, embodiments and experiences are essential to the critical thinking endeavor at the heart of University education. In SPH, we are expected:

To respect individual differences, which may include, but are not limited to, age, cultural background, disability, ethnicity, family status, gender, immigration status, national origin, race, religion, sex, sexual orientation, socioeconomic status and veteran status.
To engage respectfully in the discussion of diverse worldviews and ideologies embedded in course readings, presentations and artifacts, including those course materials that are at odds with personal beliefs and values.
To encourage students with concerns about classroom climate to talk to their instructor, adviser, a member of the departmental or SPH EDI Committee, the Assistant Dean for EDI, or the program's director.
Classroom Climate
We are co-creators of our learning environment. It is our collective responsibility to develop a supportive learning environment for everyone. Listening with respect and an open mind, striving to understand others' views, and articulating your own point of view will help foster the creation of this environment. We engage our differences with the intent to build community, not to put down the other and distance our self from the other. Being mindful to not monopolize discussion and/or interrupt others will also help foster a dialogic environment.

The following guidelines can add to the richness of our discussion:

We assume that persons are always doing the best that they can, including the persons in this learning environment.
We acknowledge that systematic oppression exists based on privileged positions and specific to race, gender, class, religion, sexual orientation, and other social variables and identities.
We posit that assigning blame to persons in socially marginal positions is counter-productive to our practice. We can learn much about the dominant culture by looking at how it constructs the lives of those on its social margins.
While we may question or take issue with another class member's ideology, we will not demean, devalue, or attempt to humiliate another person based on her/his experiences, value system, or construction of meaning.
We have a professional obligation to actively challenge myths and stereotypes about our own groups and other groups so we can break down the walls that prohibit group cooperation and growth.
[Adapted from Lynn Weber Cannon (1990). Fostering positive race, class and gender dynamics in the classroom. Women Studies Quarterly, 1 & 2, 126-134.]
We are a learning community. As such, we are expected to engage with difference. Part of functioning as a learning community is to engage in dialogue in respectful ways that supports

learning for all of us and that holds us accountable to each other. Our learning community asks us to trust and take risks in being vulnerable.

Here are some guidelines that we try to use in our learning process:
Assume that I might miss things others see and see things others miss.
Raise my views in such a way that I encourage others to raise theirs.
Inquire into others' views while inviting them to inquire into mine.
Extend the same listening to others I would wish them to extend to me.
Surface my feelings in such a way that I make it easier for others to surface theirs.
Regard my views as a perspective onto the world, not the world itself.
Beware of my assumptions of others and their motivations.
Test my assumptions about how and why people say or do things.
Be authentic in my engagement with all members of our class.

Pronouns
We share our pronouns because we strive to cultivate an inclusive environment where people of all genders feel safe and respected. We cannot assume we know someone's gender just by looking at them. So we invite everyone to share their pronouns if you are comfortable with it.

Bias Concerns
Our 2018 climate survey states that most people in SPH do not report bias incidents because they do not know where to go. Students are encouraged to report any incidents of bias to someone they feel comfortable with, including instructors, advisers or department staff. They can email dcinfo@uw.edu for immediate follow up. Bias concerns can be anonymously and confidentially reported via the online form found here:
https://sph.washington.edu/about/diversity/bias-concerns.

Sexual Harassment
Sexual harassment is a form of harassment based on the recipient's sex that is characterized by: Unwelcome sexual advances, requests for sexual favors, or other verbal or physical conduct of a sexual nature by a person who has authority over the recipient when:
Submission to such conduct is an implicit or explicit condition of the individual's employment, academic status, or ability to use University facilities and services, or submission to or rejection of the conduct affects tangible aspects of the individual's employment, academic status, or use of University facilities.
Unwelcome and unsolicited language or conduct that creates an intimidating, hostile, or offensive working or learning environment, or has the purpose or effect of unreasonably interfering with an individual's academic or work performance. These are not acceptable.

If you have experienced sexual harassment, gender discrimination, including sexual assault, relationship or intimate partner violence, stalking, or other sexual misconduct during or outside the class, you have the right to make a formal complaint and request an investigation under Title IX. Information about Title IX reporting options is available at https://www.washington.edu/titleix/report/. The University also has other designated offices to help you avoid and/or report sexual harassment: SafeCampus (https://www.washington.edu/safecampus/); Office of the Ombud (https://www.washington.edu/ombud/); and University Complaint Investigation and Resolution Office (https://www.washington.edu/uciro/).