Winter 2025: Remote Sensing For Environmental Health

Jump to Today ✎ Edit

Winter 2025: Remote Sensing for Environmental Health

EnvH 478/578: School of Public Health

UrbDP 498/598: College of Built Environments

Elective for Data Science Minor

Monday and Wednesday, 3:30-4:50 PM

UW Hans Rosling Center 145

3 credits, graded

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Assistant Professor

Departments of Urban Design and Planning and

Environmental and Occupational Health Sciences

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Office hour: Monday, 2:30pm – 3:20pm, by appointment (https://calendly.com/kthchen/office-hour-appointment)

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. The second-best option is during office hours, when we can have a 15-min discussion on your lab, project, or other questions. 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 All Students

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 Course Learning Outcomes for Graduate Students

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 lectures, discussions, 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 (https://earthengine.google.com/)**, **R**,

(https://www.r-project.org/) and QGIS (https://qgis.org/en/site/). The exercises and final project should be conducted in 3- or 4-person teams to allow for peer learning.

Evaluation

Coursework	Points (evaluation)
Reading reflections	20% (complete/incomplete)
Reading presentation	15% (complete/incomplete)
Lab exercise	25% (graded)
Poll Everywhere	5% (complete/incomplete)
Midterm presentation	10% (complete/incomplete)
Final project	25% (graded)

Final project (group work of 3-4 people):

You will conduct a satellite imagery analysis to advocate for an environmental issue impacting public health. You may choose to present your results as a media outreach or scientific publication. Students will collaborate in groups based on their course level (e.g., undergraduates may only partner with other undergraduates).

Option 1 Media Outreach

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.

Option 2 Research Paper

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.

Additional expectations for graduate students

Graduate students will 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).

Midterm presentation (group work):

Present the research proposal for the final project as a group, including the background, proposed methods, and assessment of suitability of remote sensing data.

Lab exercise reports (group work):

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.

Reading reflections (individual work):

Submit your reflections on the weekly reading on the Canvas's discussion board before the Wednesday class starts. Graded as complete and incomplete. You will earn 4 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. Each week's reflection should cover two articles. When the number of readings is more than two, you can choose which two to write about. 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. (2-3 sentences)
- a question about the method that you don't fully understand or a point you would like to learn more. (2-3 sentences)

Graduate students will additionally provide

- critiques, such as the weakness of the method, a bias in the research design, or an alternative approach you would prefer to adopt for your research. (one paragraph)

Reading presentation and discussion (group work):

Each group should present an overview of one week's readings and lead discussion with other students once in the quarter. The presentation and discussion of the two readings last a total of 15-20 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. Students are encouraged to engage in reflections posted on the Canvas discussion board.

Late Policy

Reflections 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 presentation 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 to complete your labs or final project on time, a late policy, 10% of the score deduction each day, will be enforced to ensure fairness to other students. We do recognize that some challenges are simply insurmountable, for example, physical or mental illness or a family emergency. If you foresee further accommodations needed, we encourage you to use the Disability Resources for Students (DRS) at **disability.uw.edu (http://depts.washington.edu/uwdrs/)** .

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	Lecture	Lab
1	January 6 Introduction	January 8 Asynchronous – no scheduled class Go through the “Intro to Google Earth Engine” module before the next class *Submit group member’s names*
2	January 13 Built Environments and Vegetation Index	January 15 Lab 1: Image Compositing, Band, Vegetation Index
3	January 20 Holiday (Martin Luther King Jr. Day)	January 22 Urban Expansion and Machine Learning Lab 1: Image Compositing, Band, Vegetation Index
4	January 27 'Natural' Hazard and Accuracy Assessment	January 29 Lab 2: Land Cover Classification and Accuracy Assessment
5	February 3 Power Outage and Nightlight Remote Sensing Midterm Preparation	February 5 Midterm presentation
6	February 10 Heat Extremes and Thermal Remote Sensing	February 12 Lab 3: Extreme Heat Exposure and Vulnerability

7	February 17 Holiday (Presidents' Day)	February 19 Lab 3: Extreme Heat Exposure and Vulnerability
8	February 24 Air Pollution and Atmospheric Remote Sensing	February 26 Lab 4: Air Pollution and the Pandemic Effect
9	March 3 Work on the Final Project	March 5 Work on the Final Project
10	March 10 Final project presentation	Asynchronous – no scheduled class Provide comments on the assigned peer papers by the end of March 12

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 (https://www.eefabook.org/go-to-the-book.html)** .

Weekly readings before class

Week	Topic	Readings
1	January 6 Introduction	Frumkin, H., & Haines, A. (2019). Global environmental change and noncommunicable disease risks. *Annual Review of Public Health*, 40. No reflection submission for this week.
2	January 13 Built Environments and	Rae (2018), **Europe's most densely populated square kilometres – mapped (https://www.theguardian.com/cities/gallery/2018/mar/22/most-densely-populated-square-kilometres-europe-mapped)** , The Guardian. 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

	Vegetation Index	across Denmark. *Science Advances*, 9(21). Casey, J. A., James, P., Rudolph, K. E., Wu, C. D., & Schwartz, B. S. (2016). Greenness and birth outcomes in a range of Pennsylvania communities. *International Journal of Environmental Research and Public Health*, *13*(3). 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).
3	January 20 Urban Expansion and Machine Learning	Bui et al., 2016, "**40 Percent of the Buildings in Manhattan Could Not Be Built Today (https://www.nytimes.com/interactive/2016/05/19/upshot/forty-percent-of-manhattans-buildings-could-not-be-built-today.html#:~:text=The%20reasons%20are%20varied.,could%20not%20be%20built%20today.)** ", the New York Times. Khatami, R., Mountrakis, G., & Stehman, S. V. (2016). A meta-analysis of remote sensing research on supervised pixel-based land-cover image classification processes: General guidelines for practitioners and future research. *Remote Sensing of Environment*, *177*. 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. Optional: Burke, M., Driscoll, A., Lobell, D. B., & Ermon, S. (2021). Using satellite imagery to understand and promote sustainable development. *Science*, 371(6535).
4	January 27 'Natural' Hazard and Accuracy Assessment	Rusk, 2022, "**Across Currents (https://urbanomnibus.net/2022/02/across-currents/)** ", in Urban Omnibus. Almukhtar et al. (2019), **The Great Flood of 2019: A Complete Picture of a Slow-Motion Disaster (https://www.nytimes.com/interactive/2019/09/11/us/midwest-flooding.html)** . The New York Times. 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*. Optional: Olofsson, P., Foody, G. M., Herold, M., Stehman, S. V., Woodcock, C. E., & Wulder, M. A. (2014). Good practices for estimating area and assessing accuracy of land change. *Remote sensing of Environment*, 148.

		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).
5	February 3 Power Outage and Nightlight Remote Sensing	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). Paksarian, D., Rudolph, K. E., Stapp, E. K., Dunster, G. P., He, J., Mennitt, D., ... & Merikangas, K. R. (2020). Association of outdoor artificial light at night with mental disorders and sleep patterns among US adolescents. *Jama Psychiatry*, *77*(12). Optional: Casey, J. A., Fukurai, M., Hernández, D., Balsari, S., & Kiang, M. V. (2020). Power outages and community health: a narrative review. *Current Environmental Health Reports*, *7*. Levin, N., Kyba, C. C., Zhang, Q., de Miguel, A. S., Román, M. O., Li, X., ... & Elvidge, C. D. (2020). Remote sensing of night lights: A review and an outlook for the future. *Remote Sensing of Environment*, *237*.
6	February 10 Heat Extremes and Thermal Remote Sensing	Plumer & Popovich, 2020, **How Decades of Racist Housing Policy Left Neighborhoods Sweltering (https://www.nytimes.com/interactive/2020/08/24/climate/racism-redlining-cities-global-warming.html)** . The New York Times. Chakraborty, T. C., Newman, A. J., Qian, Y., Hsu, A., & Sheriff, G. (2023). Residential segregation and outdoor urban moist heat stress disparities in the United States. *One Earth*, *6*(6). 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). Optional: Hsu, A., Sheriff, G., Chakraborty, T., & Manya, D. (2021). Disproportionate exposure to urban heat island intensity across major US cities. *Nature Communications*, 12(1).
7	February 17 Holiday (Presidents' Day)	No reading

8	February 24 Air Pollution and Atmospheric Remote Sensing	Kim, D., Kim, J., Jeong, J., & Choi, M. (2019). Estimation of health benefits from air quality improvement using the MODIS AOD dataset in Seoul, Korea. *Environmental Research*, *173*. Iungman, T., Khomenko, S., Barboza, E. P., Cirach, M., Gonçalves, K., Petrone, P., ... & Nieuwenhuijsen, M. (2024). The impact of urban configuration types on urban heat islands, air pollution, CO2 emissions, and mortality in Europe: a data science approach. *The Lancet Planetary Health*, *8*(7). Optional: Hassaan, M. A., Abdallah, S. M., Shalaby, E. S. A., & Ibrahim, A. A. (2023). Assessing vulnerability of densely populated areas to air pollution using Sentinel-5P imageries: a case study of the Nile Delta, Egypt. *Scientific Reports*, *13*(1). 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).
9	March 3 Final Project	No reading
10	March 10 Final Project	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 (http://depts.washington.edu/uwdrs/)** .

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 (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/)** .

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 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 (https://apps.leg.wa.gov/WAC/default.aspx?cite=478-121)** (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 (https://www.washington.edu/cssc/)** .

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 (https://wellbeing.uw.edu/flu-vaccination/)** and getting boosted with the updated COVID-19 vaccines (available at **clinics and pharmacies, as well as through UW Medicine (https://www.washington.edu/coronavirus/vaccines/)** 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, & Community Agreements

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.

We are co-creators of our learning environment, and it is our collective responsibility to foster a supportive and inclusive space for everyone. Together, let's co-develop community agreements to enrich our discussions and learning experiences throughout the quarter.

Here is a starting point I suggest for our community agreements:

- We don't necessarily need to agree with the ideology behind a material, but we can still critically engage with its theoretical concepts, scientific approaches, and story-telling styles.
- Mistakes are a natural part of the learning process. They can help us grow, and what we perceive as a mistake today might be seen differently tomorrow.

Now, let's hear from you!

- What do you need from others (peers, instructor) for this to be a positive, inclusive learning environment? Here are principles that multiple of us would want:
  Communication, patience, respectful listening and feedback, open-minded, constructive discussion, and kindness
  Understanding that everyone's perspective comes from different backgrounds, starting points of knowledge, and fields
  Reasonable workload and accommodation
- What do you need from others to succeed during collaborative/group work?
  Contribution: Presence and availability in class and teamwork
  Accountability: Equal contribution and fair share of work
  Respect: involving everyone in group decisions
  Communication: Check-ins on expectations and unexpected changes, willing to coordinate and bridge gaps

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/ (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/ (https://www.washington.edu/safecampus/)**); Office of the Ombud (**https://www.washington.edu/ombud/ (https://www.washington.edu/ombud/)**); and University Complaint Investigation and Resolution Office (**https://www.washington.edu/uciro/ (https://www.washington.edu/uciro/)**).

Course Summary:

Date	Details	Due
Mon Jan 13, 2025	Week 2 Discussion (https://canvas.uw.edu/courses/1813479/assignments/9910633)	due by 12pm
Wed Jan 22, 2025	Week 3 Discussion (https://canvas.uw.edu/courses/1813479/assignments/9910632)	due by 12pm
Sun Jan 26, 2025	Lab 1 (https://canvas.uw.edu/courses/1813479/assignments/9910638)	due by 11:59pm
Mon Jan 27, 2025	Week 4 Discussion (https://canvas.uw.edu/courses/1813479/assignments/9910631)	due by 12pm
Fri Jan 31, 2025	Lab 2 (https://canvas.uw.edu/courses/1813479/assignments/9910639)	due by 11:59pm
Tue Feb 4, 2025	Midterm Proposal & Slides (https://canvas.uw.edu/courses/1813479/assignments/9910642)	due by 11:59pm
Mon Feb 10, 2025	Week 6 Discussion (https://canvas.uw.edu/courses/1813479/assignments/9910629)	due by 12pm
Mon Feb 17, 2025	Week 7 Discussion (https://canvas.uw.edu/courses/1813479/assignments/9910628)	due by 12pm
Fri Feb 21, 2025	Lab 3 (https://canvas.uw.edu/courses/1813479/assignments/9910640)	due by 11:59pm
Mon Feb 24, 2025	Week 8 Discussion (https://canvas.uw.edu/courses/1813479/assignments/9910627)	due by 12pm
Fri Mar 7, 2025	Lab 4 (https://canvas.uw.edu/courses/1813479/assignments/9910641)	due by 11:59pm
Sun Mar 9, 2025	Final Project Paper (https://canvas.uw.edu/courses/1813479/assignments/9910634)	due by 11:59pm
	Final Project Presentation (https://canvas.uw.edu/courses/1813479/assignments/9910635)	due by 11:59pm
Wed Mar 12, 2025	Final Project Review (https://canvas.uw.edu/courses/1813479/assignments/9910636)	due by 11:59pm
	Final grade preview (https://canvas.uw.edu/courses/1813479/assignments/9910637)	

Date	Details	Due
	Reading Presentation + Discussion (https://canvas.uw.edu/courses/1813479/assignments/9910643)	
	Week 5 Discussion (https://canvas.uw.edu/courses/1813479/assignments/10073596)	