SEFS 550: Climate Change Vulnerability, Adaptation & Societal Transformations

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Office Hours:	By appointment
Meetings:	Monday 2:30 – 5:20 pm
Class Location:	Anderson Hall #022
Credits:	3 credits
Abbrev.:	CLIMATE VULNERABILTY

Artist: *Mira Hattiangdi*

The University of Washington acknowledges the Coast Salish peoples of this land, the land which touches the shared waters of all Tribes and Bands within the Duwamish, Puyallup, Suquamish, Tulalip, and Muckleshoot Nations.

Course Purpose

Human-driven climate change unevenly impacts billions of people and the ecological systems they depend on. Consequently, climate adaptation is essential for reducing loss and harm. This course addresses several pressing and complex questions: How do different framings of climate vulnerability affect adaptation planning and decision-making? What are the roles and limits of adaptation in responding to climate change? How can academics, practitioners, and policymakers integrate and advance equity- and sustainability into climate adaptation? And how does adaptation fit (or detract) from broader movements for reimagining our planet in a world of crisis?

Course Description

This graduate seminar explores subjects of climate change vulnerability, adaptation, and societal transformations. The course begins by establishing an understanding of climate change impacts, emphasizing how differentiated and uneven climate risks come to exist within our societies. The concept and practices of climate change adaptation are then surveyed across diverse inland, urban, coastal, and agricultural contexts. By foregrounding the causes of climate vulnerability, we will explore the possibilities, limitations, and critiques of climate adaptation. Finally, the course introduces the concept and movements behind social-ecological transformations for shaping just and sustainable futures. These objectives are achieved through diverse theoretical and applied readings, in-depth discussions, critical reading reflections, and occasional guest speakers.

Learning Objectives

By the end of this graduate seminar, students will be able to:

1. Describe the purpose and significance of climate adaptation and describe its manifestations within and across sectors.
2. Classify multiple analytical frameworks of climate vulnerability from the social and physical sciences and synthesize their respective strengths and limitations.
3. Identify the complex social, economic, political, and environmental contexts in which climate adaptation emerges from and responds to.
4. Define core concepts in adaptation sciences including adaptive capacity, resilience, vulnerability, and their interconnections.
5. Identify the dominant approaches of climate adaptation policies, programs, and activities.
6. Formulate procedural and substantive criteria for effective climate adaptation.
7. Explain the dynamics by which adaptation can exacerbate climate-related risks.
8. Elaborate why social-ecological system transformations are needed beyond climate change adaptation activities.

Format

The course meets once per week for approximately 3 hours. You should dedicate 8-10 hours per week for the course, inclusive of class time.[1] Course materials will be available online through UW Canvas (https://canvas.uw.edu). No additional purchases are required. Each meeting will consist of a short lecture, Discussion Leader (see Assignments), class discussions, and where possible, guest speaker(s). Course meetings are scheduled to occur in-person.

Religious Accommodation

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/).

Disability Access and Accommodation

It is the policy and practice of the University of Washington to create accessible learning environments consistent with federal and state law, including establishing reasonable accommodations for all students. If you have already established accommodations with Disability Resources for Students (DRS), please activate your accommodations via myDRS so that we can discuss how they will be implemented in this course. If you have not yet established services through DRS, and you have a temporary health condition or permanent disability that requires accommodations, contact DRS directly (disability.uw.edu) to set up an Access Plan. DRS facilitates the interactive process that establishes reasonable accommodations. Conditions requiring accommodation include but are not limited to: mental health, attention-related, learning, vision, hearing, physical or health impacts.

Academic Integrity

The University of Washington Student Conduct Code (WAC 478-121) defines prohibited academic and behavioral conduct and describes how the University holds students accountable as they pursue their academic goals. Allegations of misconduct may be referred to the appropriate campus office for investigation and resolution. More information can be found online at: https://www.washington.edu/studentconduct/. I expect that you know and will follow university policies regarding all forms of academic and other misconduct. Acts of academic misconduct include:

- Cheating: unauthorized assistance for assignments; using another student's work without permission and instructor authorization; and allowing anyone to take a course assignment without instructor authorization.
- Falsification: intentional use of falsified data, information or records.

[1] For more information on course workload structure, see: https://www.washington.edu/students/reg/credit.html

- Plagiarism: representing the work of others as your own without appropriate credit.

Suspected cases of academic misconduct will be handled according to University of Washington regulations. For more information, see the College of the Environment's Academic Misconduct Policy and the Community Standards and Student Conduct website.

Notice to Students – Use of Similarity Detection Software

The University of Washington has a license agreement with SimCheck, an educational tool that helps prevent or identify plagiarism from Internet resources. I may use the service in this seminar by requiring that assignments submitted electronically be checked by SimCheck. The SimCheck Report will indicate the amount of original text in your work and whether all your material used is appropriately referenced.

Policy on ChatGPT and AI-Based Tools

Following guidance from the University of Washington's Community Standards & Student Conduct, this course prohibits students from using ChatGPT and other AI-based applications to support with and/or complete course assessments, unless permission is explicitly obtained from the professor. This course deems AI-based tools as a form of "unauthorized assistance in taking quizzes, tests, or examinations, or completing assignments" (per WAC 478-121-107).

Student Academic Grievance Procedures

The College of the Environment Student Academic Grievance Procedures provide mechanisms for enrolled students to address academic problems or grievances in an equitable, respectful and timely manner. Academic grievances are defined as those involving conflicts between a student or students and their course instructors (including faculty and teaching assistants) or research mentor(s) with respect to differences arising within credit-bearing work and while the student is registered at the University of Washington. If you have or are experiencing such a conflict in this class, and have not, cannot, or do not wish to attempt resolution with me, I encourage you to explore additional options open to you by accessing the SEFS Reporting Concerns and Grievances webpage.[2]

Face Coverings in the Classroom

The health and safety of the University of Washington community are the institution's priorities. Masks are always encouraged for in-person meetings. Please review and adhere to the UW COVID Face Covering Policy[3].

[2] https://sefs.uw.edu/about/reporting-concerns-and-grievances/

[3] Effective as of November 21, 2023: https://www.ehs.washington.edu/system/files/resources/COVID-19-face-cover-policy.pdf

WINTER 2024 Course Topics

Week	Theme	Weekly Topic	Due Dates	
			Mon. Before Class Due Date	Fri. Due Date (11:59pm)
Week 1: January 02	**No Class:** UW instruction begins January 03, 2024			
Week 2: January 09	Climate Vulnerability: *Adaptation to What?*	• Course & Class Introduction • Charter Development • *Why Adaptation, Why Now?* • Class Exercise: *Climate Vulnerability*		Discussion Leader Sign-up (By Wed. January 10)
Week 3: January 16		Climate Vulnerability I: Classic Critical Approaches	Reading Reflection	
Week 4: January 23		Climate Vulnerability II: Relational Approaches	Reading Reflection	Project Proposals (Due: January 26, 11:59pm)
Week 5: January 30	Climate Change Adaptation: *Who Adapts, and How?*	Resilience, Adaptation, and Adaptive Capacity I: Core Concepts	Reading Reflection	
Week 6: February 06		Resilience, Adaptation, and Adaptive Capacity II: Critical Approaches	Reading Reflection	
Week 7: February 13		What is "Effective" Adaptation?	Reading Reflection	
Week 8: February 20	*Transformations*	Climate Maladaptation	Reading Reflection	
Week 9: February 27		Beyond Adaptation: Transformations	Reading Reflection	
Week 10: March 05		Project Presentations, Class Synthesis & Next Steps	Reading Reflection	Final Projects (Due March 08, 11:59pm)

Assignments

Overview

This course is run as a graduate-level seminar. This means that reading, critical responses, and discussion are essential to your success and learning. You should complete each week's readings **before** coming to class and will need to complete them for your weekly reading reflections. Conceptual and theoretical readings will be complemented with applied case study readings each week to illustrate core concepts.

The course follows the University of Washington Grading System. To convert percentages into grade points scores, this course follows the guidance provided by SEFS / ESRM. A grade below 1.7 will be recorded as 0 by the Registrar and will not count toward total credit count nor the grade and credit requirements for graduate students; a 2.7 grade point is the lowest attainable grade for a graduate student.[4]

%	Grade Point
100	4
99	4
98	4
97	4
96	4
95	4
94	3.9
93	3.8
92	3.7
91	3.6
90	3.5
89	3.4
88	3.3
87	3.2
86	3.1
85	3
84	2.9
83	2.8
82	2.7
81	2.6

%	Grade Point
80	2.5
79	2.4
78	2.3
77	2.2
76	2.1
75	2
74	1.9
73	1.8
72	1.7
71	1.6
70	1.5
69	1.4
68	1.3
67	1.2
66	1.1
65	1
64	0.9
63	0.8
62	0.7
≤ 61	0

[4] See https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/

The course assignments are:

Assignment	Points
Class Participation	25 points
Discussion Leader (in pairs)	15 points **(Sign-up using this link by January 10)**
Weekly Reading Reflection (2.5 points each x 8 weeks)	20 points (DUE: Mondays at 11:59pm)
Project Proposal	5 points (DUE: January 26 at 11:59pm)
Project Presentation	10 points (In-class on March 05)
Final Project	25 points (DUE: March 08 at 11:59pm)

Class Participation (25%)

Students will actively participate in-class contributing to their own learning and to that of their peers. An inclusive grading approach will recognize the quality of participation in open-floor and small-group discussions. Students may further consider posting on the Canvas discussion board. Attending class is not synonymous with participating in class.

Excellent (90-100% [3.5-4.0 GPA])	Competent (80-89% [2.5-3.4 GPA])	Needs work (<80% [< 2.5 GPA])
• Asked and answered questions demonstrating reflection and synthetic understanding of the materials covered. • Contributed respectful, clear, and constructive questions and answers. • Fostered effective collaboration within groups. Advanced open-floor class contributions through recognizing and actively building-on other students' participation.	• Asked and answered questions infrequently or provided frequent contributions that did not reflect or advance core contributions of the materials. • Contributed respectful questions and answers within group settings. • Occasionally advanced class contributions in open floor discussions.	• Contributions were rare and/or largely superficial. • Questions and answers were often unclear, not constructive and/or respectful. • Group participation may have been disruptive. Regularly failed to advance open-floor discussions with the class.

Weekly Reading Reflections (20%)

Each week (Monday before the weekly Tuesday meeting) you will need to submit a weekly reflection based on the week's reading. This reflection should not be more than one page single-spaced. A second page can be used to cite references. An effective reflection will have three parts:

Part 1: Cogently summarize the contribution from each required reading (1/4 page).

Part 2: Reflect on how the material has impacted your learning (1/2 page). Questions including but not limited to the following may be answered:

- Is the reading relevant and impactful for your own thesis or other research? If so, why?
- Has the reading advanced, complicated, or challenged your understanding of a certain concept or idea?
- What is the most significant gap in the reading (or set of readings)?
- How might you re-consider your analysis of a previous paper we read and discussed?

Part 3: To help shape our in-class conversations, provide bullet points on the following (1/4 page):

- One or two parts of a / the reading(s) you found especially confusing, if at all; and
- One or two specific discussion questions for the class.[5]

Excellent (90-100% [3.5-4.0 GPA])	Competent (80-89% [2.5-3.4 GPA])	Needs work (<80% [< 2.5 GPA])
• Readings were accurately summarized and reflected the main contributions of each weekly article; • The analysis was critical and highly reflective; and • Specific and clear questions for class discussion were posed.	• Reflections captured the general contributions of each reading; • The analysis did not strongly reflect or demonstrate significant learning or depth; and • Questions for class discussion were posed but lacked clarity.	• The main contributions of each reading were not accurately captured; • The analysis was largely superficial with significant room for improvement in reflection and critical thinking. • Questions for class discussion were not posed.

[5] I acknowledge a prior SEFS 550 student for providing me with this suggestion.

Discussion Leader (15%)

Groups of 2 will form a Discussion Leader pair and sign-up for one week during the quarter to organize a short (15-20 minute) presentation that includes a set of critical discussion questions and/or a discussion activity related to the week's readings. You may present additional themes and insights from some or all the optional readings. Do not spend over 5-7 minutes summarizing the readings. We expect that all students have completed them. Your main task is to synthesize the required and some optional readings, develop uniting themes and ideas, identify potential contradictions, and offer the class a discussion-related activity (either open-floor, or small-group) that will contribute to the week's learning objectives.

You should sign-up using the provided Google Drive link by January 10.

Excellent (90-100% [3.5-4.0 GPA])	Competent (80-89% [2.5-3.4 GPA])	Needs work (<80% [< 2.5 GPA])
• Discussion Leaders accurately synthesized the main contributions and themes of required readings and integrated additional insights from some of the optional readings. • Discussion questions and activity were thought-provoking and encouraged significant reflection and feedback from the class. • Leaders were clear and cogent in their presentation and facilitated the discussion activity to contribute to the week's learning objectives.	• Discussion Leaders accurately synthesized the main contributions and themes of required readings. • Discussion questions and activity encouraged some reflection from the class relative to the week's learning objectives. • Leaders were clear and cogent in their presentation; however, struggled at times to facilitate and advance the class discussion.	• Discussion Leaders inaccurately synthesized the main contributions and themes of required readings. • Discussion questions and activity failed to encourage reflection from the class relative to the week's learning objectives. • Leaders were unclear in their presentation and struggled to facilitate a meaningful class discussion.

Final Applied Project (40%: Proposal + Presentation + Case Analysis)

This course aims to provide students with the intellectual tools to apply concepts in the human dimensions of environmental change and adaptation to their own research interests. To advance this, students will self-develop an individual or small group project of their own interest.

This course adopts a "structured flexibility"[6] learning approach to the Final Applied Project where students can apply the course ideas and learning objectives in a manner that best reflects their own professional growth and direction. **Examples of your Final Applied Project can include a thesis proposal, advancing a thesis chapter, a research manuscript, or another project.** You will be evaluated on the depth and extent to which the course material is applied to the project of your choice (detailed rubrics forthcoming). We will dedicate a portion of Class Meeting #1 (January 09, 2024) to a collective brainstorm about this.

Below are a handful of different examples to help inspire you.

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Last year, students formed small groups to critically analyze a climate adaptation policy and develop evidence-based recommendations for informing or improving adaptation effectiveness using desktop research. Some example projects included:

1. Evaluating extreme heat mitigation policies in Seattle (King County), Vancouver (British Columbia), and Portland (Multnomah County) and presented their recommendations for adaptation planning and vulnerability reduction to key decision-makers, including the Climate Equity Program Manager, at King County.
2. Identifying factors that contributed to vulnerability from wildfire smoke to inform current policy and research efforts in Washington State.
3. Analyzing the processes through which a "transformative" coastal resilience intervention was developed in New York City and the perspectives and interests that benefited and were adversely impacted by it.

Other Hypothetical Examples:

Other examples of individual or small group projects could include:

- Learning from regional climate disaster events, such as Yellowstone's recent (2022) 500-year flood event, how should Washington State's Parks Adaptation Plan[7] be reconceptualized and re-strategized to protect people and nature?
- As of 2023, the United Nations Adaptation Fund[8] had implemented 136 projects in over 100 countries across sectors ranging from agriculture, food security, water management, and others. Analyze completed projects across one sector (e.g. water

[6] I credit Mihaela Giurca at the UW Center for Teaching and Learning (CTL) for this idea.

[7] https://cig.uw.edu/wp-content/uploads/sites/2/2019/10/Washington-Parks-Adaptation-Plan-Final.pdf

[8] The Kyoto Protocol establishes and funds the Adaptation Fund to respond to adaptation challenges in global South contexts across several different sectors: https://www.adaptation-fund.org/about/. For project information see: https://www.adaptation-fund.org/projects-programmes/project-information/projects-table-view/

management) to synthesize how vulnerability is conceptualized, adaptation strategies are implemented, and the extent to which key principles for effective adaptation are followed.
- The "Loss and Damage" Fund from COP 28 is operational. More information is becoming available about the kinds of assistant provided, and the structure of the Fund. What are some strengths, deficiencies, and limitations of the Fund, based on the existing information at-hand?

Through the above examples, students have considered the following questions:

- What does vulnerability mean in the context you study? How might you recommend it be reconceptualized based on the materials we have covered?
- Who, if any, are excluded from the processes of creation and what might this impart on policy or project outcomes?
- How effective are, or might be, adaptation activities implemented?
- What potential risks exist, even with implemented adaptations, and why?
- What are the limitations of the current policy or project?
- What leverage or intervention points might you suggest to create long-lasting impacts?

Collective Group Project

A third option includes the opportunity for the class to participate in a "collective" final project. This would involve us all conducting research towards a shared research question and objective. A possible outcome is to unify the research strength of the class to develop a robust project that can be publishable and shareable with the larger adaptation sciences community. One example of a possible question is:

- *What are effective examples of adaptation around the world, and what exactly made them effective?*

Case Study Proposal

Your proposal is due Monday January 29, 2024 (by 11:59 pm). The proposal should not be more than one (1) page single-spaced, excluding references. If you are working in a small group, only one group member is required to submit on the Team's behalf. Your proposal should provide the following:

- What "Project Option" did you or your small group select?
- In half (0.5) a page, describe your project:
    - For **Project Option #1:**
        - Outline what you aim to study or research.
        - Describe what you aim to accomplish or deliver after the next five weeks.
        - Briefly rationalize why this project is relevant to the seminar.
    - For **Project Option #3:**
        - Describe the adaptation case study and its context (e.g. What is it? Where is it occurring? Why is it occurring?, etc.).
        - Do you have a general idea that this could be "effective" in some manner? If so, please describe why. Feel free to reflect on what you perceive the

project to accomplish without significant or in-depth research to answer this sub-bullet.
    - Briefly describe how you envision what adaptation "effectiveness" means at this current moment (NOTE: Bullet points are suitable).
- **Both Projects #1 and #3:** In half (0.5) a page or less, provide a Table of Contents of what you anticipate your deliverable to look like.
- **Both Projects #1 and #3:** Use a second page to provide an initial bibliography of relevant sources. This can include sources from the class material.

Please ensure each question is suitably addressed in your proposal.

Case Study Presentation

Each student or student group will present their project during the last in-person class (March 05, 2024). Details forthcoming.

Case Study Paper

The case study analysis is due March 08, 2024 (by 11:59 pm). The case should be approximately ~ 5-6 pages single spaced, including the Abstract and excluding references and appendices. The final submitted version should address questions and comments received during the presentation. Rubric forthcoming.

WINTER 2024 SCHEDULE

Week 1 (January 02, 2024): No Class: UW instruction begins January 03, 2024

Week 2 (January 09, 2024): Course Introduction

Learning Activities:

1. Peer and course (syllabus) introduction
2. Develop a "Class Charter" for constructive and positive interactions.
3. Understand the learning objectives and identify additional peer-developed objectives.
4. Mini-Lecture: *Setting the scene – Why adaptation, why now?*
5. Group Brainstorm: Final Applied Projects
6. Class Exercise: *What is climate vulnerability, and what causes it?*

Required Readings: This syllabus.

Optional Readings:

- Rockström, J., W. Steffen, K. Noone, *et al.* (2009). A safe operating space for humanity. *Nature* 461(7263): 472-475.
- Táiwò, O.O., de Tejada Cuenca, A.S., Tsoi, C.H. (2021). Appendix B: Colonialism and Climate Vulnerability. In: Táiwò, O.O. *Reconsidering Reparations*. Oxford University Press: Oxford.
- IPCC (2022): Summary for Policymakers [H.-O. Pörtner, D.C. Roberts, E.S. Poloczanska, K. Mintenbeck, M. Tignor, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem (Eds.)]. In: *Climate Change 2022: Impacts, Adaptation and Vulnerability.* Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O.Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (Eds.)]. Cambridge University Press, Cambridge and New York, pp. 3–33.
- UNFCCC (2023). First Global Stocktake [Draft decision: FCCC/PA/CMA/2023/L.17].

Key Concepts: Anthropocene; climate vulnerability; adaptation; adaptation financing; climate justice.

Week 3 (January 16, 2024): Climate Vulnerability I: Classic Critical Approaches

Learning Objectives:

1. Summarize the frameworks of vulnerability and their relationships with adaptation.
2. Appreciate different ontological and epistemological approaches to vulnerability.
3. Begin to understand the causal factors that exacerbate climate risk and perpetuate uneven socio-spatial patterns of vulnerability.
4. Apply vulnerability theories to complex social-ecological problems, such as famine and disasters.

Required Readings (in order):

Theoretical / Conceptual:

- Thomas, K., Hardy, R. D., Lazrus, H., Mendez, M., Orlove, B., Rivera-Collazo, I. et al. (2019). Explaining differential vulnerability to climate change: A social science review. *Wiley Interdisciplinary Reviews: Climate Change* 10(2): e565.

Applied Cases (*Select one of):*

- O'Brien, K., Eriksen, S., Nygaard, L. P., & Schjolden, A. N. E. (2007). Why different interpretations of vulnerability matter in climate change discourses. *Climate Policy* 7(1): 73-88.
- Goldsmith, L., Raditz, V., & Méndez, M. (2022). Queer and present danger: Understanding the disparate impacts of disasters on LGBTQ+ communities. *Disasters* 46(4): 946-973.

Optional Readings:

- Adger W.N. (2006) Vulnerability. *Global Environmental Change* 16(3): 268-281.
- Recommended: Ribot, J. (2014). Cause and response: vulnerability and climate in the Anthropocene. *The Journal of Peasant Studies* 41(5): 667-705.
- Sen, A. (1981). *Poverty and Famines: An Essay on Entitlement and Deprivation.* Chapter 1 – Poverty and Entitlements: 1-8. Oxford University Press: Oxford.
- Watts, M. J., & Bohle, H. G. (1993). The space of vulnerability: the causal structure of hunger and famine. *Progress in Human Geography* 17(1): 43-67.

Key Concepts: Vulnerability; hazards-based approach; social vulnerability; political-ecology and political-economy; structural oppression; access and entitlements.

Week 4 (January 23, 2024): Climate Vulnerability II: Relational Approaches

Learning Objectives:

1. Develop an understanding of "environmental discourses", how certain visions of vulnerability are promoted, and the practical implications of this.
2. Recognize how climate vulnerability is constructed by different forms of knowledge and power.
3. Appreciate how climate vulnerability is "relational".

Required Readings:

Theoretical / Conceptual:

- Webber, S. (2013). Performative vulnerability: climate change adaptation policies and financing in Kiribati. *Environment and Planning A* 45(11): 2717-2733.
- Goldman, M. J., Daly, M., & Lovell, E. J. (2016). Exploring multiple ontologies of drought in agro-pastoral regions of Northern Tanzania: A topological approach. *Area* 48(1): 27-33.

One of:

- Mehta, L. (2001). The manufacture of popular perceptions of scarcity: Dams and water-related narratives in Gujarat, India. *World Development* 29(12): 2025–2041.
- Turner, M. D. (2016). Climate vulnerability as a relational concept. *Geoforum* 68: 29-38.

Optional Readings:

- Thomas, K. A., & Warner, B. P. (2019). Weaponizing vulnerability to climate change. *Global Environmental Change* 57: 101928.
- Overview of Piers Blaikie's scholarship (and general vulnerability approaches): Forsyth, T. (2008). Political ecology and the epistemology of social justice. *Geoforum* 39(2): 756-764.
- Highly Recommended: Sultana, F. (2021). Climate change, COVID-19, and the co-production of injustices: A feminist reading of overlapping crises. *Social & Cultural Geography* 22(4): 447-460.
- Theoretical but Highly Recommended!: Robbins, P., & Marks, B. (2010). Assemblage Geographies. In S. Smith, R. Pain, S. Marston, & J.P. Jones III (Eds.), *Sage Handbook of Social Geographies* (pp. 176–194). SAGE Publications: London, U.K.

Key Concepts: Environmental discourses; power; performativity; social constructivism; relationality.

Week 5 (January 30, 2024): Resilience, Adaptation, and Adaptive Capacity I: Core Approaches

Learning Objectives:

1. Identify different research traditions in resilience (engineering, ecological, social-ecological).
2. Understand the linkages between vulnerability, adaptive capacity, and resilience.
3. Consider the complexity of governance and management of social-ecological systems.

Required Readings (in order):

Theoretical Readings:

- Folke, C. (2006). Resilience: The emergence of a perspective for social–ecological systems analyses. *Global Environmental Change* 16(3): 253-267.
- *One of:*
    - Engle, N. L. (2011). Adaptive capacity and its assessment. *Global Environmental Change* 21(2): 647-656.
    - Wannewitz, M., & Garschagen, M. (2023). Collective adaptation to climate change. *Current Opinion in Environmental Sustainability* 61: 101248.
    - Smit, B., & Wandel, J. (2006). Adaptation, adaptive capacity and vulnerability. *Global Environmental Change* 16(3): 282-292.

Applied Case:

- Ruiz-Aviles, V. D., Pijawka, D., Manuel-Navarrete, D., White, D., & Ortiz-Garcia, C. (2022). Restoration versus transformative adaptation of community drinking water systems after Hurricanes Irma and Maria in Puerto Rico. *Journal of Emergency Management* 19(8): 25-40.

Optional (Highly Recommended) Readings:

- Adger, W. N., Eakin, H., & Winkels, A. (2009). Nested and teleconnected vulnerabilities to environmental change. *Frontiers in Ecology and the Environment* 7(3): 150-157.
- Highly Recommended: Nalau, J., Becken, S., & Mackey, B. (2018). Ecosystem-based Adaptation: A review of the constraints. *Environmental Science & Policy* 89: 357-364.
- Miller, F., Osbahr, H., Boyd, E., Thomalla, F., Bharwani, S., Ziervogel, G. et al. (2010). Resilience and vulnerability: complementary or conflicting concepts? *Ecology and Society* 15(3).
- Gallopín, G. C. (2006). Linkages between vulnerability, resilience, and adaptive capacity. *Global Environmental Change* 16(3): 293-303.

Key Concepts: Resilience; vulnerability; Panarchy; scale; complexity; social capital; teleconnections.

Week 6 (February 06, 2024): Resilience, Adaptation, and Adaptive Capacity II: Critical Approaches

Guest: Dr. Grant Gutierrez, City of Seattle

Learning Objectives:

1. Develop critical thinking skills around the "who", "what", and "why" of adaptation and resilience processes and outcomes.
2. Identify critiques of resilience and adaptation science.
3. Begin to understand the potential tensions between adaptation and climate justice.
4. Connect critical resilience thinking with the case of the "Resilience District" in Seattle.

Required Reading:

Theoretical / Conceptual Readings:

- Eriksen, S. H., Nightingale, A. J., & Eakin, H. (2015). Reframing adaptation: The political nature of climate change adaptation. *Global Environmental Change* 35: 523-533.
- Johnson, D. E., Parsons, M., & Fisher, K. (2022). Indigenous climate change adaptation: New directions for emerging scholarship. *Environment and Planning E: Nature and Space* 5(3): 1541-1559.

Applied Readings:

- Zehner, E. (2021). Resilience District Concept Gathers Momentum in Seattle. Lincoln Institute of Land Policy. Accessible from: https://www.lincolninst.edu/publications/articles/2021-04-climate-health-equity-resilience-district-concept-gathers-momentum-in-seattle

Optional Applied Readings:

These readings are optional and are produced by Walker Macy and Jacobs Engineering Group – consultancies involved in sea-level rise adaptation research for the City.

- Walker Macy (2023). Duwamish Valley Sea Level Rise Adaptation Strategy: Task 1. Opportunities and Barriers for Community Resilience. Accessible from: https://www.seattle.gov/documents/Departments/OSE/Duwamish/Resilience%20District/Advisory%20Group%20meeting%20materials/05.19_Memo_SLR.pdf
- Walker Macy (2023). Sea-Level Rise (SLR) Draft Alternatives - Presentation. Accessible from: https://www.seattle.gov/documents/Departments/OSE/Duwamish/Resilience%20District/Advisory%20Group%20meeting%20materials/SLR%20Draft%20Alternatives%20-%20Presentation.pdf
- Walker Macy (2023). SLR Evaluation Criteria and Sub-Criteria. Accessible from: https://www.seattle.gov/documents/Departments/OSE/Duwamish/Resilience%20District/Advisory%20Group%20meeting%20materials/SLR%20Evaluation%20Criteria%20Summary%20Memo%20for%20posting.pdf
- Seattle Public Utilities. (2021). South Park Sea Level Rise Adaptation Vision Summary. Accessible from: https://www.seattle.gov/documents/Departments/OSE/Duwamish/South%20Park%20Se

a%20Level%20Rise%20Adaptation%20Strategy%20-%20Final%20Summary%20%282%29.pdf

Optional Readings:

- Thomas, A., Theokritoff, E., Lesnikowski, A., Reckien, D., Jagannathan, K., Cremades, R., et al. (2021). Global evidence of constraints and limits to human adaptation. Regional Environmental Change 21(3): 1-15.
- Kaika, M. (2017). 'Don't call me resilient again!': The New Urban Agenda as immunology… or… what happens when communities refuse to be vaccinated with 'smart cities' and indicators. *Environment and Urbanization* 29(1): 89-102.
- Gonda, N., Flores, S., Casolo, J. J., & Nightingale, A. J. (2023). Resilience and conflict: rethinking climate resilience through Indigenous territorial struggles. *The Journal of Peasant Studies*: 1-27.
- Very Highly Recommended (but social theory heavy): Cote, M. & A. J. Nightingale. (2012). Resilience thinking meets social theory: situating change in socio-ecological (SES) systems research. *Progress in Human Geography* 36(4): 475- 489.
- Highly Recommended: Nielsen, J. Ø., & Reenberg, A. (2010). Cultural barriers to climate change adaptation: A case study from Northern Burkina Faso. *Global Environmental Change* 20(1): 142-152.
- Highly Recommended: Fabinyi, M., et al. (2014). Social-ecological systems, social diversity, and power: insights from anthropology and political ecology. *Ecology & Society* 19(4): 28
- Welsh, M. (2014). Resilience and responsibility: governing uncertainty in a complex world. *The Geographical Journal* 180(1): 15-26.
- Whyte, K. (2018). Critical investigations of resilience: A brief introduction to Indigenous environmental studies & sciences. *Daedalus* 147(2): 136-147.
- Highly Recommended (Excellent case study): Curry, G. N., Koczberski, G., Lummani, J., Nailina, R., Peter, E., McNally, G., & Kuaimba, O. (2015). A bridge too far? The influence of socio-cultural values on the adaptation responses of smallholders to a devastating pest outbreak in cocoa. *Global Environmental Change* 35: 1-11.

Key Concepts: Political-ecology; power; inequity; structure; agency.

Week 7 (February 13, 2024): What is "Effective" Adaptation?

Learning Objectives:

1. Identify criteria that constitute "effective" climate adaptation.
2. Brainstorm specific metrics for evaluating "effectiveness".
3. Appreciate how resistance can invite opportunities for pluralizing adaptive futures.

Required Readings:

What do we know about adaptation implementation?

- Berrang-Ford, L., Siders, A. R., Lesnikowski, A., Fischer, A. P., Callaghan, M. W., Haddaway, N. R. et al. (2021). A systematic global stocktake of evidence on human adaptation to climate change. *Nature Climate Change* 11(11): 989-1000.
- Owen, G. (2020). What makes climate change adaptation effective? A systematic review of the literature. *Global Environmental Change* 62: 102071.
- *One of:*
    - Brink, E., Falla, A. M. V., & Boyd, E. (2023). Weapons of the vulnerable? A review of popular resistance to climate adaptation. *Global Environmental Change* 80: 102656.
    - Mills-Novoa, M. (2023). What happens after climate change adaptation projects end: A community-based approach to ex-post assessment of adaptation projects. *Global Environmental Change* 80: 102655.
    - Mills-Novoa, M., Boelens, R., Hoogesteger, J., & Vos, J. (2023). Resisting, leveraging, and reworking climate change adaptation projects from below: placing adaptation in Ecuador's agrarian struggle. *The Journal of Peasant Studies* 50(6): 2283–2311.

What makes adaptation successful?

- Singh, C., Iyer, S., New, M. G., Few, R., Kuchimanchi, B., Segnon, A. C., & Morchain, D. (2022). Interrogating 'effectiveness' in climate change adaptation: 11 guiding principles for adaptation research and practice. *Climate and Development* 14(7): 650-664.

Optional Readings:

- Araos, M., Jagannathan, K., Shukla, R., Ajibade, I. et al. (2021). Equity in human adaptation-related responses: A systematic global review. *One Earth* 4(10): 1454-1467.
- Simpson, N. P., Williams, P. A., Mach, K. J., Berrang-Ford, L., Biesbroek, R., Haasnoot, M. et al. (2023). Adaptation to compound climate risks: A systematic global stocktake. *iScience* 26(2): 105926.
- Highly Recommended: Findlater, K., Webber, S., Kandlikar, M., & Donner, S. (2021). Climate services promise better decisions but mainly focus on better data. *Nature Climate Change* 11(9): 731-737.
- Adger, W. N., & Barnett, J. (2009). Four reasons for concern about adaptation to climate change. *Environment and Planning A*, *41*(12), 2800–2805.
- Dilling, L., Prakash, A., Zommers, Z., Ahmad, F., Singh, N., de Wit, S. et al. (2019). Is adaptation success a flawed concept?. *Nature Climate Change* 9(8): 572-574.

Key Concepts: Effective adaptation; sustainability; equity; justice; community-based; scale.

Week 8 (February 20, 2024): Climate Maladaptation
Guest: Meagan Carmack, University of Washington

Update [02-15-2024]: While you are welcome to read the full set of readings, you can also opt to read only one that is most related to your work (vs. the full set). The purpose is such that you have enough time for your project work.

Learning Objectives:

1. Define and conceptualize climate maladaptation.
2. Begin to understand the processes and dynamics that transition adaptive interventions into maladaptive outcomes.
3. Reflect on the opportunities and challenges for mitigating, preventing, and reversing maladaptation.

Required Readings:

- Eriksen, S., Schipper, E. L. F., Scoville-Simonds, M., Vincent, K., Adam, H. N., Brooks, N., et al. (2021). Adaptation interventions and their effect on vulnerability in developing countries: Help, hindrance or irrelevance?. *World Development* 141: 105383.
- *One of:*
  - Hardy, R. D., Milligan, R. A., & Heynen, N. (2017). Racial coastal formation: The environmental injustice of colorblind adaptation planning for sea-level rise. *Geoforum 87*: 62–72.
  - Johnson, D., Parsons, M., & Fisher, K. (2023). Adaptation at whose expense? Explicating the maladaptive potential of water storage and climate-resilient growth for Māori women in northern Aotearoa. *Global Environmental Change* 82: 102733.
  - Thomas, K. A. (2023). Accumulation by adaptation. *Geography Compass*: e12731.

Optional Readings:

- Highly Recommended: Schipper, E. L. F. (2020). Maladaptation: When adaptation to climate change goes very wrong. *One Earth* 3(4): 409-414.
- Very Highly Recommended: Bertana, A., Clark, B., Benney, T. M., & Quackenbush, C. (2022). Beyond maladaptation: structural barriers to successful adaptation. *Environmental Sociology* 8(4): 448–458.
- Highly Recommended: Eriksen, S., Aldunce, P., Bahinipati, C. S., Martins, R. D. A., Molefe, J. I., Nhemachena, C. et al. (2011). When not every response to climate change is a good one: Identifying principles for sustainable adaptation. *Climate and Development* 3(1): 7-20.
- Highly Recommended: Glover, L., & Granberg, M. (2021). The politics of maladaptation. *Climate* 9(5): 69.
- Magnan, A. K., Schipper, E. L. F., Burkett, M., Bharwani, S., Burton, I., Eriksen, S. et al. (2016). Addressing the risk of maladaptation to climate change. *Wiley Interdisciplinary Reviews: Climate Change* 7(5): 646-665.

Key Concepts: Maladaptation; maladaptive dynamics ("redistributive", "rebounding", "reinforcing" vulnerability); accumulation.

Week 9 (February 27, 2024): Beyond Adaptation: Transformations

Update [02-15-2024]: While you are welcome to read the full set of readings, you can also opt to read only one or two that are most related to your work. The purpose is such that you have enough time for your project.

Learning Objectives:

1. Develop a critical understanding of the concept of social-ecological transformation.
2. Identify key strategies that may be effective in systems change.
3. Consider how organizations and institutions may limit the effectiveness of systems change.
4. Appreciate how transformations may lead to unanticipated effects.

Required Readings:

Theoretical / Conceptual:

- Few, R., Morchain, D., Spear, D., Mensah, A., & Bendapudi, R. (2017). Transformation, adaptation and development: relating concepts to practice. *Palgrave Communications*, 3(1): 1-9.
- Blythe, J., Silver, J., Evans, L., Armitage, D., Bennett, N. J., Moore, M. L., *et al.* (2018). The dark side of transformation: Latent risks in contemporary sustainability discourse. *Antipode* 50(5): 1206-1223.

Applied Cases (one of):

- Ranganathan, M., & Bratman, E. (2021). From Urban Resilience to Abolitionist Climate Justice in Washington, DC. *Antipode* 53(1): 115–137.
- Táiwò, O. (2021). *Reconsidering Reparations.* Chapter 5 -- What's Next: Why Reparations Require Climate Justice: 149-190. Oxford University Press: Oxford.

Optional Readings:

- Highly Recommended: Lonsdale, K., Pringle, P., & Turner, B. (2015). *Transformative adaptation: What it is, why it matters and what is needed*. Oxford University Press: Oxford
- Fedele, G., Donatti, C. I., Harvey, C. A., Hannah, L., & Hole, D. G. (2019). Transformative adaptation to climate change for sustainable social-ecological systems. *Environmental Science & Policy* 101: 116–125.
- O'Brien, K. (2012). Global environmental change II: From adaptation to deliberate transformation. *Progress in Human Geography* 36(5): 667-676.
- Shah, S. H., Rodina, L., Burt, J. M., Gregr, E. J., Chapman, M., Williams, S. *et al.,* (2018). Unpacking social-ecological transformations: Conceptual, ethical and methodological insights. *The Anthropocene Review* 5(3): 250-265.
- Highly Recommended: Nightingale, A. J., Eriksen, S., Taylor, M., Forsyth, T., Pelling, M., Newsham, A., et al. (2020). Beyond Technical Fixes: Climate solutions and the Great Derangement. *Climate and Development* 12(4): 343-352.
- Highly Recommended: Pelling, M., O'Brien, K., & Matyas, D. (2015). Adaptation and transformation. *Climatic Change* 133(1): 113-127.

Key Concepts: Transformational adaptation; transformative adaptation; intervention points; abolition.

Week 10 (March 05, 2024): Project Presentations, Conclusions, and Next Steps

For your weekly reflection: Reflect on your last 7 statements:

- What has been impactful?
- What remaining questions do you have?
- What areas would like you advance your learning in moving forward?