

# ESM464/565

## Managing Climate Risks and Vulnerabilities: Adaptation & Mitigation

Instructor: David Kunz  
Course Time: Tues/Thurs 4:00-5:50pm  
Classroom:

Office: VIRTUAL  
Office Hours: W 4:00-5:00p or by appointment  
Contact: [dkunz@pdx.edu](mailto:dkunz@pdx.edu) 360-449-9813

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**Course Description:** This ONLINE course introduces the fundamentals of climate policy and governance at global to local levels, including the adaptation and mitigation planning and management approaches commonly used to address climate change. We will explore global climate change agreements, including the UN Framework Convention on Climate Change as well as national and local level responses to climate change. Students will learn how global initiatives, countries, and local institutions are evaluating and responding to climate risks and vulnerabilities.

**Learning Objectives.** Students will understand:

- The core risks and vulnerabilities associated with climate change
- International approaches to addressing climate change (e.g., UNFCCC, IPCC, Kyoto, Paris)
- The difference between mitigation and adaptation
- How to read and evaluate climate action and adaptation plans

GRADUATE STUDENTS, through analysis of climate action planning data, will learn about the relationships between climate action planning and mitigation or adaptation outcomes.

**Class Format and Student Activities:** Most class periods will include a lecture to introduce key concepts and provide context for the readings as well as group or whole-class discussions focused on daily reading concepts. Other activities will include case study presentations on adaptation plans, (unlikely be able to provide guest lectures during this time), and student photo essay presentations.

**Reading Materials:** This course will draw on readings from the following texts:

*Climate Change Science and Policy.* 2010. Edited by S.H. Schneider, A. Rosencranz, M.D. Mastrandrea, and K. Kuntz-Duriseti. Washington D.C.: Island Press.

*The Psychology of Climate Change Communication: A Guide for Scientists, Journalists, Educators, Political Aides, and the Interested Public.* 2009. D. Shome and S. Marx. New York City: Columbia University.

Available for free from [URL]: <http://cred.columbia.edu/guide>.

*Drawdown* 2017 Edited by Paul Hawkin Penguin Books

The first texts is available electronically through the library, <https://ebookcentral-proquest-com.proxy.lib.pdx.edu/lib/psu/detail.action?docID=3317577>

The second text can be downloaded at the URL above, or ordered for free from Columbia University.

The third can be accessed at the Drawdown.org website or at PSU Bookstore

ALL THE REQUIRED READING IS POSTED ON THE D2L SITE – STUDENTS MAY WANT TO ACCESS THE ABOVE REFERENCES FOR THEIR OWN USE

All texts will be supplemented by scientific and gray literature.

**Online Attendance and Participation:** We will use Zoom for virtual meetings and recordings in this course. Engaged participation is expected in all class activities. Participation will be a significant portion of the

expectation. As this is a challenging time for all of us, just making the effort to participate and submit the required assignments will be considered a significant effort. I will track types and levels of regular participation beyond submitting assignments. If you need special accommodations, please discuss your needs with me as early as possible and contact the Disability Resource Center. If you are ill, please let me know by email.

**Communication and Availability:** I am happy to answer questions via email, but please allow 24-48 hours for a response and check the syllabus and handouts first! You are welcome to drop into my online office hours to discuss questions about the course. If you make an appointment to Zoom at another time, please send me a description of your question by email so that I can be prepared. If you are having difficulties with the assignments or the material, please contact me directly.

**Student Conduct Code:** PSU has a well-defined conduct code, <http://www.pdx.edu/dos/codeofconduct>. Academic honesty is essential. Please do not present someone else's ideas or work without attribution. Please maintain professional conduct, and avoid using your computer/phone/tablet for personal reasons during class.

**Assessment:** Assignments will be graded with points and weighted as shown below. Due dates for assignments are shown on the course schedule.

### **Participation (25%)**

**Active Participation in Course Discussion (10%):** The content of this course requires active participation for me to evaluate your facility with the subject matter. YOU ARE EXPECTED TO CONTRIBUTE TO EVERY CLASS PERIOD BY PRESENTATING, OFFERING COMMENTS, OR BY ASKING QUESTIONS. You will be evaluated based on your ability to engage with the subject matter at a professional level with clear thinking and organization. AGAIN, IF YOU CANNOT ATTEND LIVE ZOOM CLASSES – PROVIDE A SUMMARY OF YOUR UNDERSTANDING OF THE MATERIAL IMMEDIATELY AFTER THE SCHEDULED CLASS.

**Daily Reading Questions & Student Led Discussions (15%):** For each class session in which there are required readings there will be a class discussion. For each discussion 2 students will lead a 20-30 minute discussion on the concepts from the day's readings, and all other students will provide a minimum of two questions about the day's readings. The reading questions will be read out during class; questions should be based on the content of the day's readings. Discussion leaders will develop a discussion outline and distribute a copy on D2L prior to the class (no more than 2-pages per reading). The discussion outline should summarize the objectives of the article, highlight a short list of key "take home lessons", and recap any other key points from the article important for the class to understand (e.g., methods, discussion points, etc.). Figures or tables that are important for the class to understand may be reproduced or presented as part of the discussion. Discussion presentations are encouraged to apply the concepts from the day's readings into a class activity or plan for small group discussions rather than use the entire time to recap the readings.

**Discussion leaders are excused from reading questions.**

### **Homework (75%)**

**Reflective Photo Essay (10%):** Use 2 photos you have taken that, to you, reflect climate vulnerability and climate resilience, respectively, and write a short photo essay (300-500 words) interpreting the images and how they reflect your understanding of climate change. You will present your images to the class, explain how you are interpreting the images, and summarize how they reflect your personal experience, interests, and/or expertise. The goal of this exercise is for you to bridge theory and practice by reflecting on what you believe constitutes vulnerability and resilience. This exercise is also designed to enable others to see the world from your perspective and for you to appreciate multiple points of view as you see the perspectives of others. Photo essay presentations will begin in Week 3 and continue throughout the quarter. Your written photo essay is due the day you present in class.

**Climate Action Plan Case Studies (20%):** Students will work in groups of 2-3 students to evaluate and present case studies of municipal climate action plans. A list of candidate plans will be given, but students are free to choose other case studies with my approval. Case studies will be presented (20-30 minutes) throughout the term. Students will lead a virtual field trip in the presentation, covering the required topics in an engaging manner. Details will be provided separately, but case study presentations will use a climate change planning evaluation matrix (to provide consistent methodology) that covers: (1) location and brief description of the planning entity; (2) the planning process; (3) the fact base used to motivate climate action planning; (4) the plan goals, policies, and implementation; (5) the current status of the climate action effort; and (6) recommendations for improvement. Data from the scorecard will be entered into an online database. A 3 to 5 page (single-spaced) written case study will be due 1-week following your case study presentation.

**Adaptation Memos (30%):** Three 2-page memos (worth 7.5, 10, and 12.5%, respectively) will be assigned during the quarter. A memo is a short written document designed to highlight the key information a decision maker needs to understand. Each memo will analyze a different aspect of a municipal Climate Adaptation Plan that you select to work with for the term. **Climate Action Plans and Climate Adaptation Plans are different types of documents; you must choose a Climate Adaptation Plan for this assignment.** The first memo will focus on the planning process; the second on projected climate impacts, vulnerabilities, and risks; and the third on climate adaptation strategies. A rubric detailing the expectations and grading for each memo will be handed out prior to the due date. Generally, grades are based on the following: 1) logical structure of writing, 2) use of evidence, 3) tone and professionalism, 4) appropriate use of references, and 5) written clarity (e.g., spelling, grammar, organization, etc.).

**Final Project Presentation (15%):** The final project is a presentation analyzing the municipal Climate Adaptation Plan on which you wrote your adaptation memos. Your presentation should summarize the key points of your Climate Adaptation Plan (drawing on the memos), and address how the climate policy, planning frameworks, and adaptation learning we have covered in the class are relevant. A final project assignment detailing my expectations and grading for the final project will be handed out prior to the due date. You will present your final project to the class during the last class meeting.

## Class Schedule

**Assignments:** Due on the date listed below, or as described in the assessment section of the syllabus  
**Readings:** Should be read prior to the class date on which the reading is listed

| Class  | Date   | Topic                                     | Readings     | Assignments                              |
|--------|--------|---|--------------|--|
| 01A    | Mar 31 | Course & Student Introductions            | 1 (in class) |  |
| 01B    | Apr 2  | CC Science and Impacts                    | 2, 3         | *  |
| 02A    | Apr 7  | International Conventions on CC           | 4, 5         |  |
| 02B    | Apr 9  | CC Mitigation & Communication             | 6, 7         | Case studies sign-up**                   |
| 03A    | Apr 14 | CC Adaptation                             | 8, 9         |  |
| 03B    | Apr 16 | Federal, Regional, and Local Adaptation   | 10, 11       |  |
| 04A    | Apr 21 | Adaptation and Mitigation as Compliments  | 12, 13       | Adaptation Memo 1                        |
| 04B    | Apr 23 | Adaptation Planning Models                | 14, 15       | Case Study 1**                           |
| 05A    | Apr 28 | CC Vulnerability                          | 16, 17       | Case Study 2                             |
| 05B    | Apr 30 | CC Risk Assessments                       | 18, 19       | Case Study 3                             |
| 06A    | May 5  | CC Adaptation Strategies                  | 20, 21       | Case Study 4                             |
| 06B    | May 7  | Monitoring and Evaluating CC Adaptation   | 22, 23       | Adaptation Memo 2                        |
| 07A    | May 12 | Overcoming Barriers to CC Adaptation      | 24, 25       | Case Study 5**                           |
| 07B    | May 14 | Developed vs. Developing Country Equity   | 26           | Case Study 6                             |
| 08A    | May 19 | Environmental Justice and Climate Justice | 27, 28       | Case Study 7***                          |
| 08B    | May 21 | Drawdown and California's Plan            | 29           | Case Study 8                             |
| 09A    | May 26 | Portland Climate Action Plan              | 30           | Adaptation Memo 3 Due<br>(Guest Speaker) |
| 09B    | May 28 | Oregon GHG Accounting                     | 31           | (Guest Speakers)                         |
| 10A    | Jun 2  | Resources for Action                      | 32           |  |
| 10B    | Jun 4  | Final Project Presentations               | --           | Final Project<br>Presentations           |
| Finals | -----  | NO FINAL                                  | -----        | -----                                    |

Assignment details will be distributed for upcoming Case Studies\*, Adaptation Memos\*\*, and Final Posters\*\*\*.

### Readings:

1. IPCC 2014 Summary for policymakers. In *Climate Change 2014: Impacts, adaptation, and vulnerability* (pp. 4-10 and 25-30) and 1a National Climate Assessment pp. 19-49
2. *Climate Change Science and Policy (CCSP) Chapter 1 (Climate Change Science Overview), CCSP Chapter 2 (Detection and Attribution).*
3. Nelson, E, P. Karieva, M. Ruckelshaus, et al. Key ecosystem services that are being disrupted by climate change in the US. *Frontiers in Ecology and the Environment* 11:483–493.
4. CCSP Chpt 21 (International Treaties)
5. Ostrom 2010 Polycentric systems for coping with collective action and global environmental change. *Global Environmental Change* 20:550–557.
6. CCSP Chapter 27 (CDM and Mitigation in Developing Countries) & 29 (Understanding the Climate Change Challenge in China)
7. *Climate Change Communication Guide (CCCG) – Introduction – Chapter 5 (pp.1-29)*
8. CCSP Chapter 42 (The Road Forward)
9. Adger, W.N., S. Dessai, M. Goulden, M. Hulme, I. Lorenzoni, D.R. Nelson, L.O. Naess, J. Wolf, A. Wreford. 2009. Are there social limits to adaptation to climate change. *Climate Change* 93: 335-354.
10. CCSP Chapter 33 (National Policy) and Chapter 36 (US State Climate Action)
11. Bierbaum, R., J.B. Smith, A. Lee, M. Blair, L. Carter, F.S. Chapin III, P. Fleming, S. Ruffo, M. Stults, S. McNeeley, W. Wasley, and L. Verduzco. 2013. A comprehensive review of climate adaptation in the

- United States: more than before, but less than needed. *Mitigation and Adaptation Strategies for Global Change* 18:361-406.
12. Boswell, M.R., A.I. Greve, and T.L. Seale. 2012. Chapter 1: Climate Action Planning, p.1-31. *Local Climate Action Planning*. Washington D.C.: Island Press.
  13. Boswell, M.R., A.I. Greve, and T.L. Seale. 2012. Chapter 8: Communities Leading the Way, p.199-225. *Local Climate Action Planning*. Washington D.C.: Island Press
  14. Center for Ocean Solutions 2010 – Climate change adaptation planning model – Module 2 (Overview of the Climate Change Planning Model)
  15. Center for Ocean Solutions 2010 – Climate change adaptation planning model – Module 4 (Climate Change Resilience, Vulnerability and Risk)
  16. Ribot, J.C. 1995. The Causal Structure of Vulnerability: Its Application to Climate Impact Analysis. *GeoJournal* 35:119-122.
  17. O'Brien, K., Eriksen, S., Nygaard, L. P. and Schjolden, A. 2007. Why Different Interpretations of Vulnerability Matter in Climate Change Discourses. *Climate Policy* 7:73–88.
  18. Jones, R. 2001. An Environmental Risk Assessment/ Management Framework for Climate Change Impact Assessments. *Natural Hazards* 23: 197-203.
  19. Lei, Y. and Wang, J. 2014. A preliminary discussion on the opportunities and challenges of linking climate change adaptation with disaster risk reduction. *Natural Hazards* 71:1587-1597.
  20. Center for Ocean Solutions 2010 – Climate change adaptation planning model – Module 5 (Developing Adaptation Strategies)
  21. Moser, S.C. 2010. Communicating climate change: History, challenges, processes, and future directions. *Climate Change* 1:31-53.
  22. Basset and Shandas 2010. Innovation and Climate Action Planning: Perspectives from municipal plans. *Journal of the American Planning Association* 76: 435-450.
  23. Reckien, D., J. Flacke, R.J. Dawson, O. Heidrich, M. Olazabal, A. Foley, J.J.-P. Hamann, H. Orru, M. Salvia, S. De Gregorio Hurtado, D. Geneletti, and F. Pietrapertosa. 2014. Climate Change Response in Europe: What's the reality? Analysis of adaptation and mitigation plans from 200 urban areas in 11 countries. *Climate Change* 122:331-340.
  24. Moser, S.C. and J.A. Ekstrom. 2010. A framework to diagnose barriers to climate change adaptation. *Proceedings of the National Academy of Sciences* 107:22026-22031.
  25. CCCG Chapters 6-8 (pp. 30-38)
  26. CCSP Chapter 24 (Inequities and Imbalances), Chapter 25 (Ethics, Rights, and Responsibilities), Chapter 26 (Developing Country Perspectives)
  27. Duus-Otterstrom, G. and Jagers, S.C., 2012. Identifying burdens of coping with climate change: A typology of the duties of climate justice. *Global Environmental Change* 22:746-753.
  28. Bulkeley, H., G.A.S. Edwards, and S. Fuller. 2014. Contesting climate justice in the city: Examining politics and practice in urban climate change experiments. *Global Environmental Change* 25:31-40.
  29. Drawdown.org and
  30. Portland Climate Action Plan 2010
  31. TBD
  32. TBD

**We will use Zoom for virtual meetings and recordings in this course. Your use of Zoom is governed by the Acceptable Use Policy and PSU's Student Code of Conduct. A record of all meetings and recordings is kept and stored by PSU, in accordance with the Acceptable Use Policy and FERPA. Individual use and distribution of recording is limited to academic purposes.**

### **Statement for Title IX Reporting Obligations**

Portland State is committed to fostering a safe, productive learning environment. Title IX and our school policy prohibit discrimination on the basis of sex, which regards sexual misconduct — including harassment, domestic and dating violence, sexual assault, and stalking. We expect a culture of professionalism and mutual respect in our department and class. Please be aware that as a faculty member, I have the responsibility to report any instances of sexual harassment, sexual violence and/or other forms of prohibited discrimination to PSU's Title IX Coordinator, the Office of Equity and Compliance or the Dean of Student Life and cannot keep information confidential. You may report any incident of discrimination or discriminatory harassment, including sexual harassment, to either the [Office of Equity and Compliance](#) or the [Office of the Dean of Student Life](#). If you would rather share information about sexual harassment or sexual violence to a confidential employee who does not have this reporting responsibility, you can contact a confidential advocate at 503-725-5672 or by scheduling on-line ([psuwrc.youcanbook.me](https://psuwrc.youcanbook.me)) or another confidential employee found on the sexual misconduct [resource webpage](#). For more information about your obligations and resources for sex/gender discrimination and sexual violence (Title IX), please complete the required student module [Creating a Safe Campus](#) in your D2L.

### **Access and Inclusion for Students with Disabilities**

PSU values diversity and inclusion; we are committed to fostering mutual respect and full participation for all students. Our goal is to create a learning environment that is equitable, useable, inclusive, and welcoming. If any aspects of instruction or course design result in barriers to your inclusion or learning, please notify me.

**If you have, or think you may have, a disability that may affect your work in this class, please contact your instructor.** You may also contact the Disability Resource Center to schedule an appointment and initiate a conversation about reasonable accommodations. The DRC is located in 116 Smith Memorial Student Union, 503-725-4150, [drc@pdx.edu](mailto:drc@pdx.edu), <https://www.pdx.edu/drc>.

For information about emergency preparedness, please go to the Fire and Life Safety webpage (<https://www.pdx.edu/environmental-health-safety/fire-and-life-safety>) for information.