

Managing Complex Environmental Systems

NRS-ENVS 386 Fall 2021

Course information

Class meetings: M/W 9:30-10:45

Location: CNR 108

Instructor: Dr. Chloe Wardropper, Assistant Professor, Natural Resources and Society

Office: CNR 17D

Office hours: Tuesday 2-3pm or by appointment

Email: cwardropper@uidaho.edu

Course description

At the core of many environmental issues are complex social and environmental processes that drive changes for couple social and ecological systems at multiple scales. Historically, academic disciplines have struggled to understand the multiple causes of environmental problems; thus, interdisciplinary approaches are increasingly used to study linked processes. This course will help students assess conditions within coupled systems, identify problems, and then recommend management and government solutions. Drawing on principles from political science, sociology, and ecology, we will use case studies to learn about key concepts in including institutions, resilience, vulnerability, adaptation, and feedbacks.

Learning Outcomes

NRS Program Learning Outcomes addressed:

- Communicate effectively, through oral, written and graphic communication, with diverse audiences, especially within interdisciplinary teams and with conservation stakeholders (SLO 1)
- Critically evaluate and integrate concepts and knowledge from ecological, social, economic and political perspectives (SLO 2)
- Integrate and assess diverse viewpoints (SLO 4)

UI Learning Outcomes addressed:

- *Communicate:* Create and practice effective oral, written, and graphic communication.
- *Learn and Integrate:* Gain an understanding of the foundations of social-ecological systems theories and how these are used across disciplines. Gather, critically evaluate, and use appropriate scientific research materials (e.g., scientific sources, secondary socio-demographic data) for written and oral reports.
- *Think and Create:* Use ArcGIS Online to describe case studies.
- *Clarify Purpose and Perspective:* Practice iterative idea generation through drafting and group work
- *Practice Citizenship:* Identify and understand the development of policy and the application of regulations used in environmental management.

Readings

All readings will be available on BBLearn.

Notes: 1) Reading responses will be due every Friday afternoon. 2) Have your readings available for discussion on the days they are assigned – either have them open on your computer or print a hard copy. **Do not** access the readings on your phone during class. 3) I may make small changes in assigned readings throughout the semester, which I will update to BBLearn.

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Expectations

This is an upper-level course meant to prepare students for jobs as natural resource professionals and citizens. Therefore, I expect active participation and a high level of professionalism in all participation and products. In order to facilitate active discussions, there will be no cell-phone use in class. Computer use should be limited to course-related activities. Your participation grade will be based on your meaningful participation in each week's section (i.e., participate in activities, ask questions, offer ideas in discussions).

Attendance

This class is a collaborative endeavor, which makes it imperative for students to attend all classes. Any more than 2 unexcused absences from section will lower your participation grade by one letter, with one letter grade additional for each following. If you have a legitimate reason for an absence (e.g. medical appointment, job interview), please notify me as soon as possible.

Writing and academic honesty

Sources will be cited using the APA style. The Purdue University Owl Online Writing Lab (<http://owl.english.purdue.edu/owl/resource/560/01/>) can help you with the APA style. The UI Writing Center (<https://www.uidaho.edu/class/writing-center>) can help you with writing.

Plagiarism will not be tolerated. Plagiarism may include 1) the direct copying of another's writings with or without minor rephrasing, without citing the original source, and 2) not indicating directly quoted passages when a work is used (and cited) as a general source. The University of Idaho Student Code of Conduct governs academic honesty. All suspected instances of academic dishonesty will be referred to the Dean of Students. Sanctions, including receiving a grade of "F" for the course, may be imposed.

Center for Disability Access and Resources (CDAR)

Reasonable accommodations are available for students who have documented temporary or permanent disabilities. All accommodations must be approved through the Center for Disability Access and Resources (CDAR) to notify your instructor(s) as soon as possible regarding accommodation(s) needed for the course. Website: www.uidaho.edu/current-students/cdar

COVID-19 Considerations

We will follow university guidelines. As of August 23rd, you are required to wear a face covering over your nose and mouth in the classroom and in UI buildings at all times. Evaluate your own health before coming to class and stay home if you are experiencing known symptoms of COVID-19. This policy will be reevaluated every three weeks. If you have any questions about the policy, please contact the Covid-19 Coordinator at covid19questions@uidaho.edu. Failure to wear a face covering when required means you will be required to leave the classroom. If a disruption to the learning experience occurs due to repeated offence and/or egregious behavior, it will be referred to the Dean of Students Office for potential code violation.

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Assignments

Basic information:

1. **Weekly reading responses will be due every Friday at 5pm before the coming week. Prompts will be posted by Thursday morning.**
 - a. Reading responses are approximately 300 words in length and allow you to reflect on and synthesize what you read before coming to class. We will grade based on effort – if you respond thoroughly to each part of the prompt with a clear explanation of your answer, you will get 3 points. If you do not attempt to answer fully, you will not receive a point for that portion of the response.
2. **Most other assignments will be due at 5pm on Fridays**, or as specified on the syllabus/BbLearn.
3. Unless I have granted an extension ahead of time, late work will be marked down 10% per day.
4. Spelling and grammar checks are expected.
5. I am available to meet during office hours or by appointment to discuss any aspect of the course and assignments. Please get in touch.

| Assignment | Due date | Points possible |
|--------------------------------------------------|--------------------------------------------|--------------------------------------------|
| Participation (~25%) | | |
| Attendance and active participation | Every class | 1 point x 22 classes = 22 |
| Weekly reading response (RR) | Every Friday before the coming week at 5pm | 3 points x 8 (lowest 2 of 10 dropped) = 24 |
| | | 46 |
| In-class assignments (~15%) | | |
| Resilience Assessment workbook | 9/1 | 4 |
| IAD diagram | 9/15 | 4 |
| SVI in ArcGIS Online | 10/6 | 4 |
| Silver Valley ArcGIS Online | 10/20 | 4 |
| Salton Sea ArcGIS Online | 10/27 | 4 |
| Alaska Solution Trees | 11/10 | 4 |
| International case studies | 11/15 | 4 |
| | | 28 |
| Analyzing, Writing, and Presenting (~35%) | | |
| Resilience Assessment | 10/1 | 20 |
| Final Project | | |
| a) Proposal | a) 11/5 | a) 5 |
| b) Map Viewer draft | b) 11/12 | b) 2 |
| c) Storymap outline | c) 12/1 | c) 3 |
| d) Storymap final | d) 12/6 | d) 30 |
| e) Presentation | e) 12/6 or 8 | e) 10 |
| | | Total: 50 |
| | | 70 |
| Exam (~25%) | | |
| Midterm | 10/13 | 46 |
| | | 46 |
| Extra Credit | | |
| News article summary | Until 12/10 | 4 |
| TOTAL | | 190 |

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Class schedule (Note: I will announce in class and update on BBLearn if there are significant changes)

| Week | Dates | Focus | Readings | Due |
|------|--------|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| 1 | M 8/23 | Introduction; Why study complex environmental systems? | | |
| | W 8/25 | Social-ecological systems; Focal systems; Resilience; | - Walker and Salt (2006). Ch. 1 in <u>Resilience Thinking</u> . - Resilience Assessment (RA) Workbook Sections Introduction, 1, 1.1, 1.2 - Washington Coast Resilience Assessment, Executive Summary | |
| | F 8/27 | | | Wk2 Reading Response (RR) |
| 2 | M 8/30 | Introduction to systems; Disturbances; Feedbacks; Introduce Resilience Assessment Assignment | - Anderies and Janssen (2013). Ch. 12: “Feedbacks and stability” in <u>Sustaining the Commons</u> - Walker and Salt (2006). Ch.3 “Crossing the threshold” - RA Workbook Sections 1.3, 1.4, 2.2, 2.3, 3.2, 3.3 - Carpenter et al. (2007) “Understanding regional change.” | |
| | W 9/1 | <i>RA Workbook in class assignment</i> | | |
| | F 9/3 | | | Wk3 RR |
| 3 | M 9/6 | No class – Labor Day | | |
| | W 9/8 | The Commons | - Anderies and Janssen (2013) Ch. 1. “Why study the commons?” - RA Workbook Sections 4., 4.1 - Rowley (2016). “How dwindling fish stocks got a reprieve.” | |
| | F 9/10 | | | Wk4 RR |
| 4 | M 9/13 | Institutions and governance | - Anderies and Janssen (2013) Ch. 2: “Defining institutions” - Ostrom (2005). Ch. 9. “Robust governance in polycentric institutions.” In <u>Understanding Institutional Diversity</u> . - Cagle (2020). “Everything you need to know about California’s water law” | |
| | W 9/15 | Guest speaker – SGMA; <i>IAD diagram in class assignment</i> | | |
| | F 9/17 | | | Wk5 RR |
| 5 | M 9/20 | Vulnerability; Social Vulnerability Index | - Turner (2003) “Vulnerability analysis in sustainability science” | |

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|---------|----------------------------------------------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | <ul style="list-style-type: none"> - Flanagan et al. (2018) “Measuring community vulnerability” - Bruggers 2021 “A triple whammy has left many...” - Becker et al. (2019) “Is green land cover associated with less health care spending?” |
| W 9/22 | Guest speaker – mapping vulnerabilities | | |
| | | | Wk6 RR |
| 6 | M 9/27 | No class – work on RA assignment | |
| W 9/29 | Risk perception; Guest speaker | | <ul style="list-style-type: none"> - Robbins et al. (2014) Ch. 3 “Risks and Hazards” in <u>Environment and Society</u> - Additional reading |
| F 10/1 | | | Wk7 RR; Resilience Assessment Assignment |
| 7 | M 10/4 | Adaptation and transformation | <ul style="list-style-type: none"> - O’Connell et al. (2015) Ch.3 “An overview of resilience, adaptation, transformation theory and application” in <u>The RATA Framework</u> - RA Workbook Section 5.3 - Abrams et al. (2017) “Rangeland fire protection associations” |
| W 10/6 | Library – ArcGIS Online intro; <i>Explore SVI in ArcGIS Online in class assignment</i> | | |
| F 10/8 | | | |
| 8 | M 10/11 | Review | |
| W 10/13 | Midterm exam | | |
| F 10/15 | | | Wk9 RR |
| 9 | M 10/18 | Silver Valley, ID case; Introduce final project | <ul style="list-style-type: none"> - Gustavson et al. (2007). “Superfund and Mining Megasites.” - EPA (2012). “Coeur d’Alene Basin Record of Decision Amendment Site Update.” - Cooper et al. (2020) “Can we have healthy living environments in mining-impacted communities?” |
| W 10/20 | <i>Silver Valley ArcGIS Online in class assignment</i> | | |
| F 10/22 | | | Wk10 RR; sign up for final project |
| 10 | M 10/25 | Salton Sea, CA case; Breaking Point film | - Pacific Institute (2014). “Hazards Toll” (read Executive Summary and Introduction) |

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| | | | - Salton Sea Management Plan (through Introduction) | |
| | W 10/27 | <i>Salton Sea ArcGIS online in class assignment</i> | | |
| | F 10/29 | | | Wk11 RR |
| 11 | M 11/1 | Newtok, AK case | - Our Changing Climate (2014) (Intro and Key Messages 3 and 5) - Marino (2012). "The long history of environmental migration" - Kim (2019). "Residents of an eroded Alaska Village" | |
| | W 11/3 | Library day – creating a StoryMap | | |
| | F 11/5 | | | Final project proposal |
| 12 | M 11/8 | Final project group work and meetings with CW | | |
| | W 11/10 | Newtok, AK case cont.; <i>Solution trees in class assignment</i> | | |
| | F 11/12 | | | Wk 13 RR; Final project Map Viewer draft |
| 13 | M 11/15 | International cases; <i>Case studies in-class assignment</i> | USAID Risk and Resilience Assessment Case Studies | |
| | W 11/17 | No class meeting - Work on final project on your own time | | |
| 14 | 11/22 week | Thanksgiving break | | |
| 15 | M 11/29 | No class meeting - Work on final project on your own time | | |
| | W 12/1 | Final project group work and meetings with CW | | Storymap outline (beginning of class) |
| 16 | M 12/6 | Presentations | | Final project; Final Presentation |
| | W 12/8 | Presentations | | |
| Final | 12/13 week | No final exam | | |