ENVS 201A Keywords and Concepts in Environmental Studies
Geography and Ecology

Monday & Wednesday 10:00-11:45 AM
455 ISB

Instructors
Andrew Szasz
430 ISB
459-4662
szasz@ucsc.edu

Gregory Gilbert
439 ISB
459-5002
ggilbert@ucsc.edu

Course Goals
ENVS 201A and 201B comprise a two-quarter sequence to explore the range of scholarly traditions that inform the kinds of research most common to the Environmental Studies department at UC Santa Cruz. We recognize and expect that you come into the program with some experience and understanding (from undergraduate classes, master's work, on-the-job training) of ecology, statistics, sociology/political science, and economics. This course is not a primer in each of these fields, but is rather designed to take a look at the key concepts, language, and epistemologies that come from different scholarly traditions, and how they intersect, produce conflict, and offer synergies in the environmental problem solving project. ENVS 201A is co-taught by a sociologist, an evolutionary ecologist, and a cohort of graduate students. The professors in ENVS 201B will be an agroecologist and an environmental planner/lawyer.

In ENVS201A we will focus on Ecology, Geography, Sociology, and Political Ecology as they inform environmental studies. Although we will review and discuss key concepts and terms, the focus will be on appreciating the roots and trajectories of different traditions, and the tensions and synergies experienced in interdisciplinary work.

Some specific goals for this quarter are:
2. Appreciate the historical roots of scientific and social inquiry.
3. Demonstrate cross-talk among the disciplines.
4. Think about what is needed for being interdisciplinary as we move on from the past.
5. Parse models of many kinds for their assumptions.
6. Analyze the conventions of different research communities.

Required Readings: We will use two texts, augmented with selected readings from the scholarly literature. Please get the texts from your favorite bookseller. The required texts are:

[We will also draw from Dodds, WK. 2009. Laws, Theories, and Patterns in Ecology. UC Press (~$22); this book is optional]

Additional readings outside these books will be available to you on the course site at eCommons (https://ecommons.ucsc.edu/portal). You will also be expected to find additional appropriate readings through the UC Library, electronically or in hard copy, to ensure you understand the keywords and concepts covered in the class.
Expectations: The more you dig into the materials in this course the more we will all get out of it. This is a group process, where we each bring our strengths to the table to share and are eager to learn from each other. We respectfully acknowledge and appreciate different understandings and uses of key concepts and key words in different traditions within Environmental Studies, search for effective ways to turn disciplinary boundaries into fertile hybrid zones, and build an interdisciplinary working group that is able to have effective and respectful discussions, disagreements, and resolutions.

We expect you to have read, thought about, and discussed all the assigned readings before class. We ask that you work in groups of 3-4 to discuss assigned readings before class and to post to eCommons (by 9:00 a.m. on the day of the class) three questions or comments (per group) about the readings for class discussion. Assignments are to be completed before class, and will be a focus of discussion during that class period. Expect to put in about 15 h per week on this class. Use whatever resources you need (Web of Science, books, the web, your cohort!) to bring yourself up to speed on unfamiliar topics before the class. Class discussions will explore of how these terms/concepts/ideas are used and understood differently by scholars from different traditions, how literature from different disciplines informs our scholarly work in Environmental Studies, and how interdisciplinary approaches can build synergism from dissonance. Faculty will make some lecture presentations for contextualization, but the core of the course is discussion, and you are expected to contribute actively through your questions and insights that arise from your own engagement with the material.

Course resources and turning in assignments: We use an online course platform called eCommons to make readings available, exchange documents, and submit assignments. When you register for the course you get automatic access to eCommons account (https://ecommons.ucsc.edu) using your UCSC email login and password (CruzGold password). Written assignments should be posted before class on the day they are due.

Assignments:
There are several specific written/quantitative assignments and one quarter-long assignment. Please post the assignments on eCommons before class, and bring them with you, ready to discuss in class.
In most many cases we ask that you work in small groups on the assignments; in all cases we encourage you to discuss the assignments among yourselves. This class is not a competition.
There is also a quarter-long individual writing assignments that we ask you to turn in each Friday on eCommons.
Details of each of these assignments is given below and on eCommons.
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 09/30</td>
<td>Introductions, Overview</td>
<td>Syllabus</td>
</tr>
<tr>
<td>W 10/02</td>
<td>Ecology in ENVS</td>
<td>Scheiner &amp; Willig; Kolasa</td>
</tr>
<tr>
<td>M 10/07</td>
<td>Population growth and regulation</td>
<td>Gotelli 1,2,3</td>
</tr>
<tr>
<td>W 10/09</td>
<td>Competition and Predation</td>
<td>Gotelli 5,6</td>
</tr>
<tr>
<td>M 10/14</td>
<td>Evolution and Extinction</td>
<td>Janzen &amp; Martin; Cavender-Bares</td>
</tr>
<tr>
<td>W 10/16</td>
<td>Communities, Diversity, Succession</td>
<td>Gotelli 7,8, Barbour</td>
</tr>
<tr>
<td>M 10/21</td>
<td>Space and time</td>
<td>Gotelli 4; Cronon 1-2; Jackson; Jablonski</td>
</tr>
<tr>
<td>W 10/23</td>
<td>Theory and the particular</td>
<td>Kricher; Shrader-Frechette; Kareiva; Powledge; Martínez ; Driscoll</td>
</tr>
<tr>
<td>M 10/28</td>
<td>Introduction to sociological analysis; the special characteristics of “Modernity”</td>
<td>Polanyi 3,4; Marx; Marx</td>
</tr>
<tr>
<td>W 10/30</td>
<td>Premodern societies’ failures developing sustainable relationship to nature</td>
<td>Denevan; Diamond; Flannery; Pointing</td>
</tr>
<tr>
<td>M 11/04</td>
<td>Premodern successes</td>
<td>Cronon 3; Rappaport; Nettig; Ponting</td>
</tr>
<tr>
<td>W 11/06</td>
<td>Creating the preconditions for the transition to modernity; environmental impacts in Europe</td>
<td>Polanyi 5,6; Marx; Marx; Engels</td>
</tr>
<tr>
<td>M 11/11</td>
<td>HOLIDAY</td>
<td></td>
</tr>
<tr>
<td>W 11/13</td>
<td>Environmental impacts elsewhere in the world</td>
<td>Crosby; Cronon 4-8; Weiskel</td>
</tr>
<tr>
<td>M 11/18</td>
<td>Political Ecology (greening political economy)</td>
<td>Robbins; Peet&amp;Watts; Vayda &amp; Walters; Walker</td>
</tr>
<tr>
<td>W 11/20</td>
<td>Environmental History (greening history)</td>
<td>Worster; Worster; Roundtable JAH</td>
</tr>
<tr>
<td>M 11/25</td>
<td>Epistemology, Interdisciplinarity, Communities of Practice</td>
<td>Wenger; Platt; Boyer; Norgaard</td>
</tr>
<tr>
<td>W 11/27</td>
<td>What is &quot;nature&quot;?</td>
<td>Cronon; Waller; Worster</td>
</tr>
<tr>
<td>M 12/02</td>
<td>Conversations about population</td>
<td>Malthus; Ehrlich; Cohen; Ellis; York; Rosa</td>
</tr>
<tr>
<td>W 12/04</td>
<td>Politics of science and research</td>
<td>Soule; Kareiva &amp; Marvier; Cronon</td>
</tr>
<tr>
<td>M 12/09</td>
<td>Finals week: presentations</td>
<td></td>
</tr>
</tbody>
</table>
Assignments
Quarter-long assignment
Pick a significant, specific environmental issue that you would like to help resolve through your scholarly work. The scope of the project should be well defined and approachable as part of a single research program. For example: “Ensuring adequate water supplies for Central Coast wildlife, agriculture, and residents” or “Developing a safe and effective substitute for Methyl Bromide in strawberry production”, but not “Stopping extinction” or “Ending famine”.
Starting point: By Friday October 4, write a project background that (1) outlines the problem and (2) justifies why it is an important problem to solve. Include (3) a brainstorm list (or mindmap, if you prefer) of the major questions or type of information you think you would need to answer to solve the problem (e.g., needed scholarship). The description (parts 1 & 2) should be no more than 2 pages.
Ongoing: Each Friday throughout the course (by noon), reflect on the topics, tools, concepts explored that week in 201A. Consider how employing that framework would affect how you approach your issue. What new questions arise? Why are they interesting questions? In what ways might those approaches be useful to helping solve the problem? Are there examples from the literature of such approaches? Reflect on benefits and challenges. Do these add new dimensions to your original list of scholarly needs? Write an additional 1-2 pages each week, and post to eCommons.
Feedback: Instructors will provide regular feedback and comments on your writing throughout the quarter.
Final written version: The final written version, include reflections on the evolution of your ideas over the course of the quarter, is due on eCommons by noon on Friday December 6.
Presentation: Monday December 9 each participant will present 10-min synopses of the development of their ideas throughout the quarter.

Population equations exercise
Due by start of class Monday 7 October. Please work in groups of 3-4.
One gravid female of each of two species of insect pest have just been introduced to Santa Cruz from Chile. Both were well studied in their native range, so we know something about their population biology, and we can assume that they will respond similarly to the vegetation and climate conditions in Santa Cruz as they did in Chile. From the literature we know that Species A reproduces continuously (with $r=2.75$) and that Species B reproduces once a year (with $r_d=2.75$). Both have a carrying capacity of 500. From your reading of Gotelli Chapters 1&2 (and assuming no time lags or variation in K):
• Decide which species is best modeled with continuous vs. discrete population growth models.
• Calculate and graph the expected population sizes for each species over 20 years.
• Which species reaches half the carrying capacity first and why?
• What is going on with the two species after 10 years?

Species interactions exercise
Due by start of class Wednesday 9 October. Please work in groups of 3-4.
The California ground squirrel (Otospermophilus beecheyi) is the most abundant mammal in the UCSC meadows. They can reach densities of 300 per ha and have litters of about 7 per year. Gopher snakes (Pituophis melanoleucus) are also quite common in the meadows, and predominantly eat ground squirrels. (Imagine that) a number of Western rattlesnakes...
(Crotalus viridis) were recently released in the Great Meadow by a collector who could no longer care for them. The rattlesnakes also consume primarily ground squirrels. Rattlesnakes are somewhat larger than gopher snakes (371g vs. 205g), have larger clutch sizes (8.3 vs. 6.9 per year). The two snake species fed at about the same intervals, but gopher snakes took larger prey for their body size; gopher snakes took prey on average 45% of body mass compared to 34% for rattlesnakes (Diller and Wallace 1996 Herpetologica 52:343-360).

Based on your readings from Gotelli Chapters 5&6:

• Make some reasonable assumptions about $K_1$, $K_2$, $\alpha$, $\beta$, $r$, $q$, (and any other simplifying assumptions you need, just specify them)
• Use state-space graphs to explore expected dynamics of each of the three species (Hint: first compare the snakes to each other for competitive interactions; then tackle the predator-prey interactions making simplifying assumptions about the predators.
• Use text to describe your expectations and outline what you think you need to know more about to refine your expectations.

Communities of practice citation trails
Due by start of class Monday 25 November. Each person should do their own paper, but you are welcome to talk with each other about process.

Consider how you can use a paper trail – the papers that a publication cites and the papers that cite a particular publication – as one tool to examine who a particular researcher is in conversation with, and to what Communities of Practice s/he may belong. Choose a paper of interest to you (maybe one you have already read) that is related to Ecology, Geography, Sociology, or Political Ecology, and that has been cited at least 20 times. Take a look at the literature that is cited in the paper – what journals and disciplines inform this paper? If the paper is in Web of Science, you might want to look it up, click through to References, and then analyze results, ranked by subject area, as a first pass. Then, again from the reference in Web of Science, click on Times Cited to see the articles that cite it, and analyze the subject areas that are citing it. Browse the titles and abstracts of the Citing Papers to get a more specific feel for who is citing it. You might want to click through to look at sample of some of the citing papers and see HOW the paper is cited (e.g., for a particular result, as a methodological model, to justify an assumption, as a theoretical advance). Write a 1-page description characterizing who this author is in conversation with – what is the Community(-ies) of Practice the researcher engages? Is the engagement symmetrical (cited vs. citing)? Support your argument quantitatively and qualitatively.
Detailed Course Syllabus and Readings

**M 9/30**  Introductions & Overview
Syllabus; Self introductions

**W 10/2**  Ecology in ENVS
[Dodds, W.K. 2009. Laws, Theories, and Patterns in Ecology. UC Press optional and recommended]

**M 10/7**  Population growth and regulation
Gotelli Chapters 1,2,3
Due: Group homework on continuous and discrete population growth models

**W 10/9**  Competition and Predation
Gotelli Chapters 5,6
Due: Group homework on species interactions models

**M 10/14**  Evolution and Extinction

**W 10/16**  Communities, Diversity, Succession
Gotelli Chapters 7,8

**M 10/21**  Space and Time
Gotelli Ch. 4; Cronon Ch 1-2;

**W 10/23**  Theory and the particular

M 10/28  Introduction to sociological analysis; the special characteristics of “Modernity”
Polanyi, The Great Transformation, Chapters 3 and 4
Marx, from “The German Ideology,” Tucker, pp. 149-154

W 10/30  Premodern societies’ failures developing sustainable relationship to nature
Denevan, “The Pristine Myth: The Landscape of the Americas in 1492”
Diamond, Collapse, Chapter 2, ”Twilight at Easter”
Flannery, The Future Eaters, selection from Chapters 4, 23 on the Maori in New Zealand
Ponting, Green History of the World, pp. 31-54, 67-82

M 11/4  Premodern successes
Cronon, Changes in the Land, chapter 3
Rappaport, “R ritual Regulation of Environmental Relations among a New Guinea People”
Nettig, “What Alpine Peasants Have in Common: Observations on Communal Tenure in a Swiss Village”
Ponting, Green History of the World, pp. 82-86.

W 11/6  Creating the preconditions for the transition to modernity; environmental impacts in Europe
Polanyi, The Great Transformation, Chapters 5 and 6
Marx on “primitive accumulation,” in Capital, Vol. 1, Tucker, pp.431-436
Marx on the working day, in Capital, Vol. 1, pp. 238-263.

M 11/13  Environmental impacts elsewhere in the world
Crosby, “Ecological Imperialism: The Overseas Migration of Western Europeans as a Biological Phenomenon”
Cronon, Changes in the Land, chapters 4-8
Weiskel, “Toward an Archaeology of Colonialism: Elements in the Ecological Transformation of the Ivory Coast”

W 11/18  Political Ecology (greening political economy)
Robbins, Political Ecology, Chapter 1, pp. 11-24.
Peet and Watts, Liberation Ecologies, Chapter 1, pp. 1-45.
Vayda and Walters, “Against Political Ecology”
Walker, “Political ecology: where is the ecology?”

M 11/20  Environmental History (greening history)
Worster, "History as Natural History"
Worster, “Doing Environmental History”

**M 11/25**  Epistemology, Interdisciplinarity, Communities of Practice
Due: Communities of Practice Paper Trail

**W 11/27**  What is “nature”?
Waller, D.M. 1998. Getting back to the right nature. A Reply to Cronon’s “The Trouble with Wilderness”.
Worster, D. The Wilderness of History.

**M 12/02**  Conversations about population

**W 12/04**  Politics of science and research

**M 12/09**  Presentation of quarter-long projects
Keywords and concepts to be covered in 201A

**Ways of Knowing**
- Covered in courses ENVS 201A and B:
  - Critical Theory
  - Deductive
  - Epistemology
  - Inductive
  - Inference
  - Grant writing
  - Modernism/post-Modernism
  - Positivism
  - Proximate vs. ultimate causes

**Ecology & Evolution**
- Covered in ENVS 201A:
  - Adaptation & Traits
  - Basic ecological models
  - Causes of species extinction
  - Density dependence
  - Disturbance
  - Interaction webs
  - Landscape Ecology
  - Measures of diversity
  - Metapopulations
  - Natural Selection
  - Predator-prey dynamics
  - Scales of diversity
  - Succession
  - Theory of Island Biogeography
  - Trophic cascades

**Geography & Political Economy**
- Covered in ENVS 201A:
  - Capital
  - Commodity chain
  - Development
  - Environmental determinism/possibilism
  - Globalization
  - Governance
  - Hegemony
  - Hybrid systems
  - Institution
  - Nation-state
  - Neo-liberalism
  - Political ecology
  - Political economy
  - Risk
  - Uneven development

**Cross-Cutting Topics**
- Covered in 201A, B, M and N:
  - Adaptation
  - Global change
  - Mitigation
  - Resilience
  - Scale
  - Sustainability
  - Vulnerability