Instructor: Dr. Colleen A. Hatfield  
240 Holt Hall  
530-898-4235  
email: chatfield@csuchico.edu  
Office Hours: T 12:30-2  
R 12-1:30; 3:30-5:00  

Level: Open to graduate and advanced undergraduate students.

Prerequisites: A course in general ecology or biogeography and a statistics course. If you do not have these prerequisites, please see me.

OBJECTIVE: Landscape ecology emphasizes spatial patterning - its causes, development and relevance to ecological systems. Students will become familiar with the conceptual and theoretical framework of Landscape Ecology as well as the quantitative and modeling tools that facilitate our understanding of spatial processes. Readings from the contemporary literature will introduce students to the current approaches in this field and encourage critical thinking and effective communication in the process.

Learning Outcomes:
- Broad-based knowledge of the basic principles of landscape ecology
- Familiarity with tools and proper techniques for spatial description, analysis and synthesis
- Improved ability to pose and answer landscape-level questions in research

COURSE FORMAT: Course topics are scheduled for each week (see Syllabus). The class will meet two hours weekly for lecture/discussion and three hours for lab. Each lecture class meeting will be devoted to a formal lecture (30-35 minutes), student presentations (35 minutes), and discussions (40 minutes) of assigned readings from the primary literature. The labs will be held in Butte 501 (unless otherwise noted) and will generally follow the week’s topic.

STUDENT PRESENTATIONS: Each student will present one 25-30 minute powerpoint presentation and lead a short discussion (10 min) on landscape ecology lecture topics (see list) during the course of the semester. The presentations allow students to more thoroughly explore a particular subject area and present that information in a clear, cohesive manner. It also provides experience in public speaking skills including leading a discussion. However, the presentation is NOT to be a methodical listing of facts or main points from the chapter or literature. Rather the goal is to become sufficiently familiar with the topic to inform and engage the class (a mere listing of facts accomplishes neither of these). When it is your turn to present you can anticipate referencing a number of different sources and the need to synthesize the information. The weekly scheduled literature might be a place to start as well as a host of on-line reference resources and don’t forget the library! It is your job to seek them out. You will submit a list of references you used in the preparation of your presentation. You also need to coordinate with the
Paper Discussion Leader for that week to enhance and compliment the peer-review literature discussions.

Remember, graduate level classes are intended to provide higher order learning and hence they require more work. Thus the expectation is that the presentations will be of a higher quality and character than one would expect in undergraduate work. The goal is to make you think, wrestle and reason with ideas and then present that journey in a coherent manner.

The presentations will be evaluated by your peers and by me. The presentations will be evaluated based on 1. Organization and clarity; 2. Familiarity with the material and 3. Style. Peers are to come to class prepared (having read the assigned readings) so that their evaluations are informed and balanced. Peer evaluations will be handed in to me at the end of class and they will be returned to the presenter at the next meeting. A presentation grade will be assigned based on my evaluation, loosely informed by student comments. Peer evaluations contribute to participation points.

READING ASSIGNMENTS: One of the goals in this course is to develop critical thinking skills. In that vane, we will devote time to discussing papers from the primary literature. Readings will be assigned weekly and copies are posted in pdf format on the course Blackboard webpage. Students will come prepared to engage in lively discussions of the current topic and to encourage this behavior, you will be expected to write a 200 word summary of each of the assigned primary literature readings each week and turn them in to me. These summaries are to be in your own words, not a mere regurgitation of the paper contents.

DISCUSSION LEADER: Each discussion will be led by a student and the responsibility will rotate among all students in the class. As discussion leader, the student should be familiar with background materials to provide context for the current papers (this will require additional reading!), provide an evaluation of the significant contributions of the paper, and raise questions and issues for discussion with the group. Rather than a 200 word summary of each article, Discussion leaders will hand in a list of references accompanied with a brief summary of each reference that they accessed in preparation for leading the discussion. (It is anticipated that this list should include at least three references.) An additional objective of the discussion leader will be to stimulate active involvement of all the class members and part of the leaders evaluation will be based on this. Again as a reminder, this is a graduate class and as such you should anticipate higher expectations and time commitment.

LAB: The labs will meet weekly with the goal of gaining hands-on experience with the tools and techniques that are used to study landscape patterns. Homework will be due at the beginning of class one week after assigned unless otherwise indicated. Late assignments will be penalized 10% per late day up to two days after the due date. No assignments will be accepted if they are later than 3 days. All assignments are to be typed unless otherwise indicated. We also potentially have the opportunity to test out some exercises that are currently under development for a new landscape ecology techniques book – thus we can’t expect it to go smoothly each and every time!

PAPER ASSIGNMENT
One written paper and one Project (web or paper based) will be assigned.

Paper Assignment: The paper will be on a topic/question that I will distribute within the first four weeks of class. Papers are intended to present a synthesis of a topic (list provided). They must show original and intelligent thought and not simply be a restatement or book report on a topic. I want to know what and how you think about a particular topic rather than what others think. You will need to use many referenced to back up your points. You will need to read the primary literature widely and then take that body of knowledge and create synthetic
arguments/observations from the material. This is not a simple book report and likely quite different from your previous writing experiences. It will be time consuming and perhaps difficult. Papers are expected to be well written and composed. I will not spend my time correcting syntax, spelling or grammar errors but they will directly be deducted from your overall grade.

A draft can be turned in a week before it is due and I will provide comments. The final paper will be due three weeks from when it is handed out. The text should be no more than 1500 words (~6 double spaced pages) excluding references and figures. Drafts will be considered a working document and will not be graded. Final papers will be graded on Organization, Clarity, Content, Thought and Style.

Project: We as a class will choose between a Web Project or a Research Paper. If we choose a web project, as a group we will select a central theme that centers around the North State. Each participant will select a specific area/topic and develop a web page that will be used to build a landscape ecology web page hosted by the Biology Department. An alternative to the web project will be a Research Project. Each student will write a well-researched paper on how principles of landscape ecology applies to their particular research project. The paper requirements are similar to the Paper Assignment described above.

ATTENDANCE:
Attendance is part of the participation grade as there is a considerable amount of information that is presented in the lecture that is not in the readings. In the event you feel compelled to miss class, you are permitted one excused absence. After that, any further absences will affect your participation and final grade.

GRADING:
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<tbody>
<tr>
<td>Presentation</td>
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<tr>
<td>Discussion Leader</td>
<td>100</td>
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<tr>
<td>Paper</td>
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<tr>
<td>Lab Exercises</td>
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<tr>
<td>Project</td>
<td>100</td>
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<tr>
<td>Participation</td>
<td>100</td>
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| **Total**              | **700**

Optional Textbooks:
No textbook is required for this course. If readings are required from textbooks, the relevant book sections will be copied for your use. However, you may find the following texts to be useful background material:


**Landscape Ecology**

**Fall 2013**

**Lecture:** Tuesday 5-7 Holt 268  
**Lab:** Thurs 5-8 Butte 501

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**Tentative Lecture Schedule**

<table>
<thead>
<tr>
<th>Week</th>
<th>Week of</th>
<th>Topic</th>
<th>Readings</th>
<th>Lab (Tentative)</th>
</tr>
</thead>
</table>
| 1    | 8/26    | Introduction and History | Wiens 1989  
Levin 1992  
Turner 2005 | Data input and interpretation |
| 2    | 9/2     | Fundamental Concepts: Landscapes and Scale | Walters 2007  
Wu 2002  
Schaefer 1995 | Scale  
Dispersion and uniformity |
Levin 1992  
Turner 2005 | Simulating Change |
| 4    | 9/16    | Sampling Design and Landscape Ecology | Stohlgren 1997  
Falk 2007  
Wellemen et al 2012 | GIS/Remote Sensing |
| 5    | 9/23    | Landscape Characterization | Nonaka 2005  
Perry 2002  
Poole 2002 | Disturbance |
| 6    | 9/30    | Measuring landscapes Landscape Metrics 1 | With and King 2001  
McGarigal 2009  
Wu 2004 | Creating Landscape Pattern |
| 7    | 10/7    | Measuring landscapes Landscape Models | Wagner and Fortin 2005  
Urban 2009  
With and King 1997 | Understanding Landscape Metrics |
| 8    | 10/14   | Measuring landscapes Geostatistical Tools | Rossi 1992  
Jenerette 2001  
Kelly 2002 | Landscape Metrics - Fragstats |
| 9    | 10/21   | Implications for Landscape Pattern: Fragmentation | Schrott et al 2005  
Gilbert-Norton 2010  
Krauss 2010 | Landscape Metrics  
Neutral Models |
| 10   | 10/28   | Implications for Landscape Pattern: Metapopulations | Treml et al 2008  
Schooley and Branch 2007  
Reding et al 2013 | Connectivity  
Meta-populations |
| 11   | 11/4    | Implications for Landscape Pattern: Disturbance | Theobald 2004  
Turner 1993  
With 2002 | Feedbacks |
| 12   | 11/11   | Landscape Change | Holdenrieder 2004  
Mattsson et al 2013  
Termorshuizen 2009 | Spatial auto-correlation |
| 13   | 11/18   | Conservation Biology | Poiani 2000  
Ranganathan 2007  
Klausmeyer et al 2011 | Reserve Design |
| 14   | 11/25   | THANKSGIVING | | |
| 15   | 12/2    | Adaptive Management Regional Planning | Landres 1999  
Farig 2011  
Naussauender and Opdam 2008 | TBA |
| 15   | 12/9    | Presentations | | Final Project/Paper |