Teaching Statement

Goals and Philosophy

Through teaching, I strive to provide students with an opportunity to:

- broaden their understanding of basic ecological concepts and natural resource conservation;
- develop critical thinking and innovative natural resource problem-solving skills;
- work, learn, and apply their knowledge and skills in an interdisciplinary environment;
- engage in active, student-directed learning that will prepare them for professional life; and
- refine their written and oral communication skills;

In addition to understanding ecological concepts, I also ask students to examine the human dimensions of natural resource conservation, including economic, political, aesthetic, and social concerns. These human dimension factors typically have a much larger impact on resource management decisions than the biological considerations. So, they can't be ignored or examined out of context of the ecological concerns. I also try to convey the need for a balanced approach to conservation issues in which ecological capabilities of the ecosystem are evaluated in light of the socio-political context within which resources are managed. Finally, I encourage students to develop their own set of environmental values and make commitments to ensuring environmental quality.

Teaching Responsibilities

My current on-campus teaching responsibilities center on the following three graduate-level courses in the Department of Natural Resources Conservation (NRC); detailed course syllabi are included in the Teaching Appendix:

- Landscape ecology: 600-level, 4 credit, lecture/lab course. This course provides a comprehensive introduction and overview of the field of landscape ecology that couples lectures on the theory and illustrated applications with computer lab projects to provide hands-on practical experience using state-of-the-art landscape analysis tools.
- Design and analysis of ecological data: 600-level, 4 credit, lecture/lab course. This course is new in Fall 2009 and is a required quantitative science course for all incoming Master's level graduate students in NRC. This course provides an introduction and overview of foundational concepts in statistics, practical issues in ecological study design, and a road map of statistical methods in ecology, and is coupled with a lab that provides hands-on training in the use of the R programming and statistical computing environment to conduct basic statistical analyses, which is prerequisite for subsequent stats courses offered through NRC.
- Multivariate statistics in ecology and conservation science: 600-level, 4 credit, lecture/lab course. This course provides an overview of multivariate statistical methods in ecology and conservation science that couples lectures on the theory with computer lab projects to provide hands-on practical experience using the R software to conduct multivariate analyses of real ecological data sets. Students are encourage

to substitute their own data sets for the ones provided to get even more practical value from the course. This course is designed to be the fourth and final course in a four-course sequence of ecological statistics courses offered through NRC.

In addition to these primary courses, between 1998-2007 I taught an undergraduate capstone course (for NRC) in ecosystem management every year, and I have periodically taught a variety of graduate-level special topics courses, often in collaboration with one of my students on a topic of their interest. As an example, in Spring 2009, in collaboration with my student Megan Chesser, I taught a 1 credit special topics seminar on wildlife pattern recognition.

In addition to these on-campus teaching responsibilities, I have undertaken one major off-campus teaching responsibility. I teach a two-week long intensive short course on landscape ecology twice each year for the USDA Forest Service. The Forest Service invited me to develop and teach this course as part of the National Advanced Silviculture Program (NASP). This Program is comprised of four course modules, each taught at a different institution around the country, and leads to certification as a silviculturalist. All foresters in the US Forest Service are required to be certified through NASP before they can assume certain responsibilities for the agency. I coordinate this course and assume the majority of the teaching, but I bring in several leaders from the field of landscape ecology to participate in the course instruction. I offer the course through the University of Montana, Missoula, in concert with my colleague and local host/instructor Dr. Sam Cushman.

Teaching Strategies

My teaching approach and strategies directly reflect my teaching philosophy (above). In all of my courses, I adopt the following teaching strategies:

- Most importantly, I adopt a student-centered, **project-based learning** approach in which students work in teams (usually interdisciplinary) to solve real-world problems. In other words, I place a strong emphasis on learning by doing. Consequently, learning new material from assigned readings and regurgitating it on exams is de-emphasized. Rather, the emphasis is on sharing knowledge and expertise (both pre-existing and newly acquired) with fellow students (in a small group environment) to address contemporary issues or analyze complex data sets. The time and energy students devote to my courses is largely in the form of group analysis of data sets (often via the use of computer models), synthesis of published scientific findings, and discussion of those findings in reference to the concepts learned from lecture and assigned readings, not in studying for exams. Accordingly, in contrast to most courses, labs form the backbone of my courses; lectures and assigned readings are designed to support the lab projects, rather than vice versa.
- To facilitate learning new concepts and gain an appreciation for the complexity of real-world natural resource issues, I emphasize the use of **computer models**. Students are exposed to computer programs that offer means to handle large and complex, and often multidimensional and spatially explicit, data sets. I emphasize the notion that these represent tools to help researchers and managers make decisions, but never replace the need for personal conceptualization, analysis and synthesis of information, and dialog on the issue.

- I strive to expose students to diverse views concerning natural resources conservation. Moreover, I strive to **empower students in the learning process** by encouraging them to share their own views, perspectives, opinions, and experiences with other students. Each student brings to the class a unique world view that has been shaped by their personal experiences, observations and unique educational background. By sharing this perspective, all of us develop a broader and richer world view and, as a result, develop a better understanding of how to apply ecological principles to solve natural resource management problems.
- I prepare **detailed notes and slide presentations** of all lecture/lab material for distribution to the students via a course website. These notes/slides/data sets cover all of the critical material covered in lecture and lab and provide an excellent source of review material and as future reference material.
- Lastly, I use several innovative strategies for **evaluating student performance**. First, as indicated above, I use projects rather than conventional exams for the bulk of the student evaluation. Second, I make use of peer-grading in all group projects. Although I evaluate the quality of the overall group project, these scores are adjusted based on peer evaluations. In this manner, each student evaluates the performance of each student in his/her group. This serves several purposes: it motivates students to work harder and also provides me the means to evaluate each individual's contribution to the group effort. Third, I use daily in-class quizzes given promptly at the start of each period to encourage punctuality and attentiveness. Quizzes cover material from the previous lecture as well as any assigned readings. This has proven an excellent way to assess attendance, attentiveness in class, and faithfulness in completing reading assignments. Finally, I make use of small group exercises in class that encourage students to work together, exchange views, and make presentations to the whole class.

Major Accomplishments

Student evaluations of my courses are very high, in fact among the highest in our Department, meeting Departmental Personnel Committee criteria for excellence in teaching (see CV) in every semester. The Department considers a score of >3.9/5 based on the average of three overarching questions as "excellence". **My average teaching evaluation across all courses is 4.43/5**, and in my two primary courses of landscape ecology and multivariate statistics, my scores are 4.64 and 4.74, respectively. In recognition of my teaching excellence, I have been **nominated by my students for the University Distinguished Teaching Award six times** since 1999, making it to the finalists round on the last two occasions.