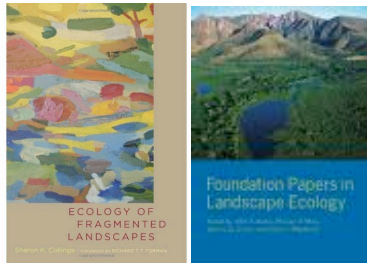


**Geography 452/552**  
**Landscape Ecology**  
**Autumn Semester, 2010**



Lecture Meetings: T: 6:00-8:50 p.m. Bldg/Room: Breland Hall Room 185  
Instructor: Dr. Michael N. DeMers Office: Breland Hall, Room 141 Phone: 496-5231  
Office Hours\*: M,W 9:30-10:30, 1:30 – 3:00, or by appointment



Collinge, Sharon K., 2009. Ecology of Fragmented Landscapes. Baltimore, Maryland, Johns Hopkins University Press

Wiens, John, Michael R. Moss, Monica G. Turner, and David Mladenoff (editors), 2006. Foundation Papers in Landscape Ecology. New York, Columbia University Press (optional but highly recommended).

**Course Description:**

This course introduces you, through readings, lecture, exercises, discussion and writing, to the basic concepts, terminology and methodology of Landscape Ecology. Landscape ecology is a relatively new approach to the study of landscape level ecology and, as such, is replete with new terminology and techniques, often incorporates modern tools such as remote sensing and geographic information systems, and has an ever growing body of literature. As students of landscape ecology it is important that you become familiar with the terminology concerning landscape structure as well as the literature and tools employed by landscape ecologists. This is not normally well done through the typical lecture/examination approach. Although the course is a lecture course you will be expected to aggressively pursue your knowledge of the science through individual investigation, outside reading, and assimilation.

The library carries the primary journal related to this field “Landscape Ecology” and all of the articles’ titles and reference information are available on line and the articles can be obtained through interlibrary loan. As early as possible you are expected to peruse these sources of information to develop a working list of key terms and subfields of Landscape Ecology. From these you will then be expected to pursue an individual line of inquiry relevant to either your own research (i.e. masters or Ph.D.), or to develop a research interest in one of these subfields.

A working knowledge of ecology, physical geography or general environmental science is assumed for this course, and will be necessary for you to keep up. If you need to brush up on these topics I suggest you begin your reading with a basic ecology or physical geography textbook. Chapter 2 in Forman and Godron (1969) Landscape Ecology – available in the library, is an excellent introduction to the topic and is quite compact.

## Grading:

To evaluate your learning, the course will have two exams, a mid-term exam worth 500 points covering lecture material approximately covering chapters 1-6 in your book and lectures 1-6, and a final exam worth another 500 points covering chapters 7-12 in your book and lectures 6-12. Exercises, and reading and recitation assignments will also be part of the course-work and will be worth an additional 500 points (approximately 50 to 100 points each depending on content and time-frame). These will be created and delivered as needed.

The final portion of the course grade will be a poster session worth 500 points. This poster will be in the form typical of poster sessions at conferences. The poster **must be directly related to either a single theme or a combination of themes common to landscape ecology**. The Landscape Ecology national meetings are in Lincoln, Nebraska this spring and you should view this as an opportunity to present some of your work. Whether or not you plan to attend these meetings you should be aware that your posters are to be displayed in room 185. The poster itself will take one of three possible forms:

1. An actual research project where you acquire data, analyze the data and produce results from your data. This does not have to be a large project, but should include graphics, pictures, etc., especially because the poster is, almost by definition, a graphic device for communication.
2. A review of current research dealing with a particular topic. The topic can be theoretical (e.g. visualization of spatio-temporal ecological data at the landscape scale), or applied (e.g. buffers and how they affect ecological processes).
3. Explanatory. In this case you might want to pick topics such as “measures of lacunarity,” or “scale, resolution, and landscape function,” or “landscape configuration and planning.” The purpose here is to demonstrate your depth of knowledge of a particular topic by creating a poster that you can talk about to others.

While posters are primarily graphic devices used for discussion, it is normally anticipated that each poster will have associated with it a one (1) page handout for the viewer. This will be handed in to your instructor and will be included in your grade. Your posters will be photographed and may be put on the department’s web page for archiving and/or advertising. Additionally, the better posters (maybe all of them if they’re great) will be displayed in the department on bulletin boards, and in classrooms. This should give you some added pressure to do a good job.

Final grading is based on a graphic classing technique known as natural breaks. This means that students tend to “break” or cluster into groups when their performance is graphically presented as a bar chart. In other words, there is typically a group of students whose grades are separably higher than their classmates. These are assigned “A” grades. Other clusters for B, C, D, and F are also separable and will be used to assign these grades. An “S” grade is considered the equivalent of a C. Although I will be keeping a running tally of your grades, please do not expect me to assign you a tentative grade. The best I can do at any time before the end of the semester is to give you a ball-park estimate that you might use to decide whether you might want to keep up the pace, work harder, or consider dropping the course. A basic guideline is the stan-

standard 90 – 80 -70 – 60 grading scheme. No tentative estimated grade will be considered as an indication of what your final grade will be.

### **Graduate Student Requirement:**

Each Graduate Student will present a review of an article of their choice from the Foundation Papers of Landscape Ecology. This article review will be written (roughly 2-3 pages double-spaced) and worth 50 points and then delivered orally (50 points).

### **Extra Credit**

**No extra credit will be given under any circumstances!** There is ample opportunity to show your mastery of the material by performing well on the exams and projects. Please do not ask for an opportunity to do extra credit. Work missed for absences that are the result of participation in University Sponsored events, bereavement, illness, or other documented, legitimate excuses can be made up after your return (please contact me upon your return).

### **Incompletes**

Incompletes are only assigned under special circumstances that prohibit the student, through no fault of their own, from completing the work. The assignment of incomplete grades requires written explanation by the student as well as a written request to the college from the instructor. Having too much work to do is not considered a legitimate excuse for not completing the assigned work. If you have too many courses, drop one or more, but do not ask for an incomplete.

### **ADA**

In accordance with the Americans With Disabilities Act students having any disability that might hamper their learning in this course should talk to the instructor so that special arrangements might be made.

# CLASS SCHEDULE

WEEK	TOPICS
1	<b>Introduction to Landscape Ecology</b> <ol style="list-style-type: none"><li>What is it?</li><li>Why has it emerged?</li><li>What are its intellectual roots?</li><li>Course objectives</li></ol>
2	<b>The concept of scale</b> <ol style="list-style-type: none"><li>Scale Terminology</li><li>Hierarchy Theory</li><li>Scale and Ecological Research</li><li>Reasoning About Scale and Moving Among Different Scales</li></ol>
3	<b>Modeling</b> <ol style="list-style-type: none"><li>Definitions and Introduction</li><li>Building Models</li><li>Landscape Models</li><li>Examining the Results of Models</li></ol>
4	<b>Causes of Landscape Pattern</b> <ol style="list-style-type: none"><li>Abiotic</li><li>Biotic Interactions</li><li>Anthropogenic</li><li>Disturbance and Succession</li></ol>
5	<b>Quantifying Landscape Pattern</b> <ol style="list-style-type: none"><li>Why Quantify Landscapes?</li><li>Data Used</li><li>Caveats for Landscape Pattern Analysis</li><li>Metrics and Statistical Analyses</li></ol>
6	<b>Neutral Landscape Models</b> <ol style="list-style-type: none"><li>Random Maps</li><li>Fractal Landscapes</li><li>Neutral Models: Pattern and Process</li><li>General Insights from Neutral Models</li></ol>
7	<b>Mid-term</b>
8	<b>Landscape Disturbances and Dynamics</b> <ol style="list-style-type: none"><li>Disturbance and Disturbance Regimes</li><li>Influence of Landscape on Disturbance Pattern</li></ol>

- c. **Influence of Disturbance on Landscape Pattern**
      - d. **Concept of Landscape Equilibrium**
- 9 **Organisms and Landscape Pattern**
  - a. **Organism-Space Interaction (basic concept)**
  - b. **Scale-dependent nature of organism response**
  - c. **Effect of Spatial Pattern on Organisms**
  - d. **Spatially Explicit Population Models**
- 10 **Ecosystem Processes in the Landscape**
  - a. **Spatial Heterogeneity in Ecosystem Processes**
  - b. **Effects of Landscape Position on Lake Ecosystems**
  - c. **Land-Water Interactions**
  - d. **Linking Species and Ecosystems**
  - e. **The Search for General Principles**
- 11 **Applied Landscape Ecology**
  - a. **Land Use**
  - b. **Forest Management**
  - c. **Regional Risk Assessment**
  - d. **Continental-scale Monitoring**
- 12 **Landscape Ecology in the Desert**
  - a. **Nature of Microheterogeneous Arid Landscapes**
  - b. **Pattern and Process**
  - c. **Desert Monitoring and Modeling**
  - d. **Current Research Questions**
- 13 **Future Research**
  - a. **What have we learned?**
  - b. **Research Directions in Landscape Ecology**
- 14 **Poster Presentations**
- 15 **Poster Presentations (continued)**
- 16 **Final Exam (TBA)**