

Soil Science/Environmental Studies 324  
**Soils and Environmental Quality**  
 Fall, 2008

**Instructor:** James G. Bockheim, 435 King Hall, 263-5903, bockheim@wisc.edu

**Lectures:** M, W, F 8:50-9:40; 357 Soils Bldg.

**Recommended Books:**

Bailey, R.G. 1998. Ecoregions: the Ecosystem Geography of the Oceans and Continents. Springer, NY. 176 pp. [Steenbock A 1.38: 1548]

Barrow, C.J. 1991. Land Degradation: Development and Breakdown of Terrestrial Environments. Cambridge Univ. Press. 295 pp. [Steenbock S623 B236]

Schlesinger, W.H. 1997. Biogeochemistry: an Analysis of Global Change (2<sup>nd</sup> edit.). Academic Press, NY. 588 pp. [Steenbock QH343.7 S35]

**Grading:** Exams (2 mid-terms and 1 final) – 60%; term paper (due Dec. 5) – 20%; class participation/attendance – 20%. Curve: 95-100 = A, 90-94 = AB, 85-89 = B, 80-84 = BC, etc.

**Lecture Schedule:**

Introduction

		<u>Optional Reading</u>
1. Introduction – scope & approach	Sept. 3	
2. Ecosystem degradation: an overview	Sept. 5	Barrow, Ch. 1
3. Ecosystem degradation, continued	Sept. 8	
4. Envir. degrad. & regional conflict	Sept. 10	Barrow, Ch. 2

The Role of Soils in the Planetary Ecosystem

5. Global geochemical cycling	Sept. 12	Schlesinger, Ch. 6
6. Biogeochemical cycling at ecosystem/ landscape scale	Sept. 15	
7. Global energy & hydrologic cycles	Sept. 17	Schlesinger, Ch. 3, 10
8. Soils and the biosphere	Sept. 19	Schlesinger, Ch. 4

Terrestrial Ecoregions of the World

9. Boreal forest and tundra	Sept. 22	Bailey, Ch. 5
10. Temperate forests	Sept. 24	Bailey, Ch. 6
11. Grasslands and deserts	Sept. 26	Bailey, Ch. 7
12. Wetlands	Sept. 29	
13. Tropical forests and savannas	Oct. 1	Bailey, Ch. 8
14. <b>Examination I</b>	Oct. 3	

Human Transformations of Terrestrial Ecosystems

15. Environmental “hotspots”	Oct. 6	
16. World Map on Soil Degradation	Oct. 8	

17. Transformation of land resources	Oct. 10	Barrow, Ch. 5-8
18. Global warming	Oct. 13	Barrow, Ch. 3
19. Urban revolution	Oct. 15	
20. Anthropogenic nitrogen deposition	Oct. 17	Barrow, Ch. 4
21. Desertification & loss of biodiversity	Oct. 20	Barrow, Ch. 8
22. Soil erosion and its control	Oct. 22	Barrow, Ch. 10
23. On-site waste disposal treatment	Oct. 24	
24. Sanitary landfills	Oct. 27	
25. Radon toxicity hazard	Oct. 29	
26. Agrichemicals – fertilizers	Oct. 31	
27. Agrichemicals – pesticides	Nov. 3	
28. <b>Examination II</b>	Nov. 5	
29. Industrial chemicals	Nov. 7	
30. Soil-borne insects/pathogens and human health	Nov. 10	

Sustainable Land Use: How Can Humankind Live Sustainably on Earth?

31. Sustainable agriculture	Nov. 12	
32. “Smart” growth and land-use planning	Nov. 14	S. Ventura
33. Case study: Chesapeake Bay	Nov. 17	
34. Sustainable forestry and watershed protection	Nov. 19	
35. Compost. MSW; precision ag	Nov. 21	R. Wolkowski
36. Bioremediation	Nov. 24	W. Hickey
37. Water conservation and quality	Nov. 26	
38. Alternative energy sources & efficiency	Dec. 1	
39. World food production	Dec. 3	
40. Solving homeowner problems	Dec. 5*	
41. Environmental impact statements	Dec. 8*	
42. Final thoughts; course evaluation	Dec. 10*	
43. <b>Examination III</b>	Dec. 12*	

\*Video taped lecture by J. Bockheim or guest lecturer

### Term Paper

A term paper covering some aspect of a soil-related environmental problem is required of each student. The paper should NOT be an extensive literature review; rather, case studies or a critique of a report or state/federal laws or rules governing pollution abatement make excellent papers. You could also critique the policies of an organization dealing with environmental issues such as WorldWatch, UNEP, etc. The paper should not exceed 10 pages (typed, double spaced).

The preliminary title and outline should be discussed with me by October 7 (see outline below). An electronic copy of the paper is due December 5, 2008 and contributes 20% of your final grade (please send to: bockheim@wisc.edu). Term papers will not be accepted after the deadline. Grading of the term paper includes suitability of the topic (10 pts.), originality of treatment (10), neatness (10), organization (20), mechanics and grammar (10), conceptualization of the problem (10), logic and conclusions (20), reference quality (10 pts.). Please make two copies of your paper, one for me to examine and one for your files.

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Soils/Environ. Stud. 324  
Term Paper Outline  
(due October 7, 2008)

Name: \_\_\_\_\_

Approximate Title:  
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Outline:

Selected References: