Environmental Geology, Fall 2015
Review for Exam 1

1. Be sure you know the key terms at the end of every chapter (p.27, 63, 91, and 114)
2. Define Environmental Geology. What types of issues are studied by environmental geologists?
3. Describe in detail the five concepts of environmental geology.
4. What is the doubling time? How does it relate to exponential growth.
5. Defend the notion that human population increase is the environmental problem and that sustainability is the solution.
6. What is a system? Why do many earth scientists consider the Earth to be system?
7. What is input-output analysis, and how does it relate to the concept of average residence time?
8. Be able to compute the average residence time for water in a pond.
9. Why do natural processes become natural hazards? Why do so many natural hazards produce catastrophes?
10. Why is solving complex environmental problems often so difficult?
11. Review the intellectual standards presented on p.23.
12. What is the precautionary principle?
13. Be able to describe in detail the major geologic cycles: tectonic, rock, hydrologic and biogeochemical.
14. What are the different types of rocks? What processes form them?
15. Review the information on stress, strain and the strength of rocks on p.44-45. Be able to describe elastic, plastic, brittle, and ductile deformation and when each might occur. What are the factors that control the types of deformation?
16. What are fractures? How do they differ from faults? Why do they have environmental significance?
17. Be able to predict the type of strain that will develop under different types of stress under brittle vs. ductile conditions.
18. What is an unconformity? How do we recognize them?
19. How do ice and wind affect the surface of the Earth?
20. Know the various soil horizons and their properties (p.66).
21. What does a soil's color tell us?
22. What is the textural classification for soils? How does it relate to the soil taxonomy as used by soil scientists and the engineering classification of soils?
23. What can we learn by doing a sieve analysis of soils?
24. What are D_n values? What are C_u and C_c? How are they derived what do they tell us about a soil?
25. What is soil fertility? How does it develop?
26. Of what importance is the moisture content of a soil?
27. What is the USCS? Be able to give a basic description of a soil from its two-letter code. (For example, GM = silty gravel, or ML = silt).
28. What are the Atterberg limits? Be able to define each.
29. What is the plasticity index? How is it related to Atterberg limits?
30. Be able to list and define the engineering properties of soils (p.71-75).
31. What determines the amount of cohesion in a soil?
32. Be able to draw a phase diagram for a soil (p.72-74), and define the unit weight, density, porosity, void ratio, moisture content, and degree of water saturation.
33. Describe how to calculate the effective pressure at a point in the subsurface.
34. How is effective pressure related to shear strength, cohesion and angle of internal friction?
35. The Universal Soil Loss equation – be able to explain the included terms (see p.80).
36. What are some environmental issues involving soils?
37. Soils are useful in developing land use planning maps. How?
38. Define Ecology. How is it related to environmental geology?

39. What is an ecosystem and how does it work? What are some basic types of ecosystems?
40. What are natural service functions?
41. What is biodiversity? How is it related to species richness, species evenness, and species dominance?
42. How does geology affect the overall conditions of an ecosystem?
43. What is a keystone species?
44. What are some factors that can increase biodiversity? What factors can reduce biodiversity?
45. How does human activity affect biological communities?
46. Describe some of the environmental difficulties that develop because of human vs. planetary time scales.
47. What is ecological restoration? Why is the first step developing a geologic, hydrologic and ecological description of the area to be restored?
48. Based upon the linkage b/w ecology and geology, what is the importance of interdisciplinary collaborations in ecological restoration?