Water in the Rise and Fall of Civilizations

ERTH 140
Fall 2007, M/W/F 9:00-9:50, MSEC 101

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Textbook: **Ward, A.D., and S.W. Trimble. 2004. Environmental hydrology. Lewis Publishers, CRC Press LLC, Boca Raton, Florida.**

COURSE OBJECTIVES

1. To examine the role of water in the development and downfall of civilizations.
2. To understand the hydrologic cycle and its effects on and by human activities.
3. To investigate the causes and effects of extreme hydrologic events.
4. To examine the role of water quality in sustainability.
5. To review the tools used to understand and predict hydrologic processes.

COURSE STRUCTURE

APPROACH

1. Monday and Wednesday class periods will be lectures and class discussions covering and expanding upon material presented in the text.
2. Friday class periods will be devoted to discussions of specific hydrologic crises, based on readings handed out in advance.
3. Homework will be assigned and graded on a regular basis.

STUDENT RESPONSIBILITIES

1. Attend and participate in all regularly scheduled classes.
2. Read assigned text sections and handouts prior to class.
3. Complete and hand in all assigned homework. Homework is due at the beginning of the designated class period. Late homework will be not be accepted unless prior arrangements are made.
4. Complete midterm and final exams.
5. Participate in a group presentation.
6. Maintain and submit a water crisis log.

STUDENT EVALUATION

1. The average homework score will count for 25% of the final grade; the midterm exams, 15% each; final exam, 25%; group presentation, 10%; crisis log, 10%.

2. The grading scale will be:
   100-90, A
   89-80, B
   79-70, C
   69-60, D
   less than 60, F
3. The final grade may be adjusted upward in recognition of active class participation and demonstrated interest.
4. In order to receive a grade of "SA", auditors will be required to attend all lectures, read assigned materials, and participate in a group presentation.

GROUP PRESENTATION

Students will be placed in one of several groups. The group will select a documented hydrologic crisis for presentation to the class. The presentation should consist of an article, book chapter, or other written resource handed out to the class for review one week ahead of the presentation. The group will then lead a class discussion on the topic, relating the event to principles discussed in the course.

WATER CRISIS LOG

You will be required to compile information on major water crises or disasters (meaning ones that you hear about via common media outlets and that have an impact on society) that occur during the semester. Good sources for information are newspapers, magazines, and the internet. The log should list major crises that occur during the course along with details on the effects (such as death/injury toll and economic impact), and your source for the information. Your log (which should be typewritten and turned in on the last day of class) will be compared with a log compiled by the instructor.

COURSE SCHEDULE

Day	Date	Topic	Text Sections
W	22 Aug.	Introduction	
F	24	Case study	handout
M	27	Hydrologic cycle	1.1-1.6
W	29	Precipitation	2.1-2.9
F	31	Case study	handout
M	3 Sep.	Academic holiday—no class	
W	5	Soils and infiltration	3.1-3.7
F	7	Case study	handout
M	10	Measurement of soil properties	3.8
W	12	Evapotranspiration (ET)	4.1-4.4
F	14	Case study	handout
M	17	Weather and ET estimation	4.5-4.7
W	19	Surface runoff	5.1-5.4

F	21	Case study	handout
M	24	Stormflow and flood estimation	5.5-5.8
W	26	Agricultural drainage	5.9-5.11
F	28	Case study	handout
M	1 Oct.	Midterm #1	
W	3	Stream characteristics	6.1-6.5
F	5	Case study	handout
M	8	Sediment transport; stream classification	6.6-6.8
W	10	Channel evolution and measurements	6.9-6.10
F	12	Case study	handout
M	14	Open channel flow	7.1-7.5
W	17	Hydraulic control structures	8.1-8.4
F	19	Academic holiday—no class	
M	22	Routing flows	8.5-8.6
W	24	Erosion	9.1-9.5
F	26	Sediment yields and sediment budgets	9.6-9.11
M	29	GSA meeting—no class	
W	31	GSA meeting—no class	
F	2 Nov.	Midterm #2	
M	5	Forest hydrology	10.1-10.6
W	7	Snowmelt and runoff	10.7-10.12
F	9	Case study	handout
M	12	Deforestation, rangelands, and wetlands	10.13-10.15
W	14	Hydrogeology and groundwater	11.1-11.3
F	16	Case study	handout
M	19	Flow to wells	11.4-11.6
W	21	Groundwater vulnerability and contamination	11.7
F	23	Academic holiday—no class	
M	26	Human impacts on stream health and flooding	12.1-12.6
W	28	Water quality protection and improvement	12.7-12.9
F	30	Presentation 1	handout
M	3 Dec.	Characteristics of remote sensing and GIS	13.1-13.3
W	5	Applications of remote sensing and GIS	13.4-13.6
F	7	Presentation 2	handout