

UNIVERSITY OF SOUTHERN CALIFORNIA
Environmental Studies Program

ENST 320a: Water and Soil Sustainability
MWF 10:00-10:50am, WPH 207

Instructor:

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Office hours: W-Th 3:30-5pm, CAS 116

Course Overview:

Both water and soil are integral to the livelihood of humans, and both are currently under threat. This class presents an overview of the issues related to water and soil sustainability including soil development and management, the hydrologic cycle, the cycling of nutrients through both soil and water, soil and water pollution, and food security related to soil and water issues.

Recommended prerequisite: ENST 100

Course Texts:

- Pennington, Karrie L. and Cech, Thomas V., Introduction to Water Resources and Environmental Issues, 457 pp., Cambridge Publishing. Referred to below as **WREI**
- Brady, Nyle C. and Weil, Ray R. Elements of the Nature and Properties of Soils, 614 pp., Pearson Publishing. Referred to below as **ENPS**

Course Requirements:

Routine attendance and active participation are an important part of each class session. For the best learning experience, you are expected to have read the course materials (see below) by the date it is discussed in class. Roll will be taken periodically in the form of thought exercises, reading assignments, and in-class questions. You are responsible for information, announcements, date changes, and any other course material presented, regardless of your participation in the classroom.

Course Learning Objectives:

- Students will gain in depth knowledge of water by focusing on how it moves through the environment, human-water interactions, and sources and types of water pollution.
- Students will explore soil science in order to understand how the physical, chemical, and biological properties of soil are important to humans and the environment.
- Students will learn how soil and water quality are linked and their importance for food production and security worldwide.
- Learning objectives in this course are aligned with those of the ENST Program (see: <https://dornsife.usc.edu/environmental-studies/learning-objectives/>).

Course Grading:

You will be graded on the basis of your performance on exams, written assignments, group presentations, and class participation (e.g., study guide discussions, Blackboard assignments,

etc.). Lecture presentations will be posted on Blackboard after the lectures. Exam questions will be drawn from course readings, lecture materials, and discussions. The Final Exam is partially cumulative and will include ~20% of material covered in the first two-thirds of the course; the remaining ~80% of the Final Exam will include only material covered after the second midterm (i.e., the last third of the course). If there is a conflict with an exam, you must email the instructor *2 weeks in advance* to see if alternative arrangements can be made (under reasonable circumstances). Otherwise, make-up exams will not be given, except in extreme emergencies. If a student misses an exam and/or assignment due to an unexcused absence, they may receive a zero for that portion of the course.

Below is a list of the graded assignments and their point value:

Midterm 1 (Sept 11)	100 pts
Midterm 2 (Oct 23)	100 pts
Final Exam (Dec 11)	125 pts
Soil Data Report (Oct 13)	30 pts
Group Project Report (Nov 20)	40 pts
Group Project Presentations (Week 16)	60 pts
Article Summaries & Discussions (rolling)	30 pts
Total Points	485 pts

Written Assignments & Group Project: Students are required to complete several different assignments related to water and soil sustainability (soil report, group project, article summaries, etc.; due dates, and point values outlined above). Group assignments (3-4 students per group) include the soil data report and group project, whereas individual students are responsible for writing their own article summaries. Specific criteria and guidelines for completing these assignments will be available on Blackboard. At the end of the semester, students will present their group project to the class. A list of potential topics will be discussed in class and made available on Blackboard. The goal of the written assignments and group project is for students to research an environmental issue using the primary literature as well as other reputable sources, take an informed position on a given issue based on available information, and present their position to either a general or specialized audience. All submissions will be evaluated for their originality, accuracy and thoroughness of research, and the overall quality of finished project.

Academic Conduct:

Plagiarism. Presenting someone else's ideas as your own, either verbatim or recast in your own words, is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Section 11, *Behavior Violating University Standards* <https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions>. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Discrimination, sexual assault, and harassment are not tolerated by USC. You are encouraged to report any incidents to the *Office of Equity and Diversity* <http://equity.usc.edu> or to the *Department of Public Safety* <http://adminopsnet.usc.edu/department/department-public-safety>.

This is important for the safety of the whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. *The Center for Women and Men* <http://www.usc.edu/student-affairs/cwm/> provides confidential support around the clock, and the sexual assault resource center webpage <http://sarc.usc.edu> describes reporting options and other resources.

Support Systems:

A number of USC's schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute* <http://dornsife.usc.edu/ali>, which sponsors courses and workshops specifically for international graduate students. *The Office of Disability Services and Programs* http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information* <http://emergency.usc.edu> will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.

Statement on Religious Observation Accommodations:

USC policy grants students excused absences from class for observance of religious activities. Students may be given an opportunity to make up work missed because of religious observance. We are responsive to requests for an excused absence when made in advance. Please note that this applies only to religious activities that necessitate a student's absence from class and/or a conflict with a specific aspect of the course.

Course Schedule

For the best learning experience, you are expected to have read assigned material by the date it is discussed in class. Chapter and article readings will be posted online. The readings and schedule of topics may be adjusted throughout the semester depending on the progress of the class.

Week 1	Aug 21, 23, 25	LA water, Water as a chemical Hydrosphere & Hydrologic cycle Article 1 (Gleick) (Aug 25)	WREI Ch. 3 See Bb
Week 2	Aug 28, 30, Sept 1	Watersheds, water supply Topo maps & delineating watersheds	WREI Ch. 5 See Bb
Week 3	Sept 6, 8	Labor Day Holiday (Sept 4) Water usage, treatment, & quality Article 2 (Grant et al.) (Sept 8)	WREI Ch. 11, 12 See Bb
Week 4	Sept 11, 13, 15	Fecal indicator bacteria Midterm 1 (Sept 11)	See Bb
Week 5	Sept 18, 20, 22	Soil development & properties Soil damage & sustainability Article 3 (Amundson et al.) (Sept 22)	ENPS Ch. 1, 2 ENPS Ch. 4, 11, 14 See Bb

Week 6	Sept 25, 27, 29	Soil salinity & pH Microbes & soil food webs	ENPS Ch. 9 See Bb
Week 7	Oct 2, 4, 6	Soil health measurements Campus field trip – TBA Soil data discussion	See Bb
Week 8	Oct 9, 11, 13	Water dynamics above & below Article 4: Dalin et al. (Oct 13) Soil data report due (Oct 13)	ENPS Ch. 5, 6 WREI Ch. 6 See Bb
Week 9	Oct 16, 18, 20	CEQA Guest Lecture (MZ) Groundwater contamination Impacts on water resources Group project meetings with DG	See Bb
Week 10	Oct 23, 25, 27	Midterm 2 (Oct 23) Nitrogen & carbon cycles Group project meetings with DG	ENPS Ch. 11, 12, 13 See Bb
Week 11	Oct 30, Nov 1, 3	Other nutrient cycles Article 5 (Cordell) (Nov 1) Food security: land Land conservation	ENPS Ch. 11, 12, 13 ENPS Ch. 14 See Bb
Week 12	Nov 6, 8, 10	Food security: water Marine conservation	See Bb
Week 13	Nov 13, 15, 17	Wetlands Coastal pollution & eutrophication Article 6 (Nov 17) Barbier et al.; Valiela and Fox	WREI Ch. 9 See Bb
Week 15	Nov 20	Coastal pollution & eutrophication Group Project Report Due (Nov 20)	See Bb
Week 16	Nov 27, 29, Dec 1 Dec 11	Group project presentations FINAL EXAM, 8:00-10:00am, WPH 207	