

ENST 320a: Water and Soil Sustainability

Section 33019R

Units: 4

Fall 2020, Fridays 12-2pm

Location: Virtual

Instructor: Dr. Audra Bardsley aka Dr. B, pronouns: she/her

Office: Zoom meeting room

Office Hours: MW, 2-3 pm or by appointment

Email: aibardsl@usc.edu

Course Description/Rationale

Both water and soil are integral to human livelihood, 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 key nutrients through both soil and water, soil and water pollution, and food security related to soil and water issues.

Learning Objectives

- Students will gain in depth knowledge of water in the environment, focusing on how water moves through the environment, how humans use and interact with water, and pollution of water.
- 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 intimately linked and their importance for food production and security worldwide.
- Learning objectives in this course are aligned with those of the Environmental Studies Program: <https://dornsife.usc.edu/environmental-studies/learning-objectives/>

Recommended preparation: ENST 100

Email/Course Communication Policy

This course will use Blackboard for communication, information and turning in assignments. When applicable, lecture recordings will be made available after the synchronous virtual lecture is given.

When reaching out by email, please put '320a' in the email title and a bit about the reason you are reaching out, e.g. 'assignment question' or 'reading guide #2'. I will do my best to respond to you within 24 hours. If you don't hear from me in 2 days, please send me a reminder email. I usually go by 'Dr. B' in my classes and you can address me that way in email.

We are living in an unusual and often very stressful time. If you are experiencing particular life or academic challenges this semester, please email me. You don't need to share details if you don't feel comfortable, but we can start a conversation and find solutions that will help you be as successful as possible this semester.

Required Readings and Supplementary Materials

1. Pennington, Karrie L. and Cech, Thomas V., Introduction to Water Resources and Environmental Issues, 457 pp., Cambridge. Referred to below as WREI
2. Brady, Nyle C. and Weil, Raymond R., Elements of Nature and Properties of Soils, Pearson. Referred to below as ENPS

Additional readings (or videos/podcasts) may be assigned periodically throughout the semester, and these will be announced in class, posted on Blackboard, and an email reminder sent to the class.

Description of Assignments

Semester Project: Impact of COVID-19 on Food Waste & Food Insecurity

In Fall 2019, ENST 320a students focused on the issue of post-consumer food waste and participated in a two-day audit that characterized food left on the plates of diners at the Parkside Café to gain a better understanding of post-consumer food waste at USC's residential dining halls and how food waste connects more broadly to resource sustainability, including soil and water resources – a major focus of this class. We estimated the energy, water, and greenhouse gas emissions that went into producing that wasted food and considered possible solutions for the USC community. I had hoped we could continue that project for the coming semester, but like so many parts of the current semester, that has to change. Instead, we will spend some time examining how our new COVID-19 reality has impacted food waste and food insecurity.

The current global pandemic has impacted almost all aspects of daily life, and food is no exception. As restaurants, schools, and businesses closed down or reduced capacity in an attempt to slow the spread of COVID-19, America's highly specialized supply chain was poorly prepared to adapt. Among the results has been staggering levels of food waste as farmers were left without buyers for their products. At the same time, the number of Americans facing food insecurity, many for the first time, surged.

Students will complete four modules that build upon the theme of food waste and food insecurity as related to the current COVID-19 crisis and make connections to concepts of resource management explored in this class.

Blackboard Participation

Most weeks throughout the semester students will earn participation on Blackboard through different types of activities including quizzes following videos/readings/podcasts, discussion board comments, performing calculations, etc. all of which will help prepare you for synchronous portions of the class.

Primary Literature Reading & Discussion

Students will read selections from primary literature, answer questions from an accompanying reading guide (turned in ahead of time), and participate in a class discussion of the article. Materials will be posted on Blackboard and responses will be assessed for completeness.

DIY Reading Guide

At the end of the semester, each student will have the opportunity to explore a topic related to water and soil sustainability that they wish had been explored more deeply in class. Everyone will

find a relevant scientific journal article (to be approved by me), then write up and answer their own reading guide style questions. Topics explored will be discussed together in class.

Addiontal Notes on Assignments

Late assignments will automatically be docked 50%. After one week late, no credit will be given unless explicit permission has been given for extenuating circumstances.

Some learning modules will require use of excel and GoogleEarth to manipulate and explore real world data. This course involves a lot of in depth reading and critical analysis outside of lecture, as it is a four unit course.

Exams

There will be two non-cummulative, take home exams this semester. Exam questions will be drawn from course readings, lecture materials, discussion, and Blackboard activites. Questions may include multiple choice, computational, fill in the blank, short answer, and essay questions. **No make-up exams will be allowed without explicit permission.** During exams, students can consult course materials, but no outside information.

Grading Breakdown

| <u>Assignment</u> | <u>Points</u> | <u>% of Grade</u> |
|-----------------------------|---------------|-------------------|
| Midterm 1 | 125 | 31% |
| Midterm 2 | 125 | 31% |
| Blackboard Participation | 50 | 13% |
| Reading Guides (4 total) | 20 | 5% |
| DIY Reading Guide | 20 | 5% |
| Semester Food Waste Project | 60 | 15% |
| TOTAL | 400 | 100% |

Grading Scale

Course final grades will be determined using the following scale. Points earned will be divided by points possible, and result rounded to the nearest full percentage point.

| | |
|----|--------------|
| A | 93-100 |
| A- | 90-92 |
| B+ | 87-89 |
| B | 83-86 |
| B- | 80-82 |
| C+ | 77-79 |
| C | 73-76 |
| C- | 70-72 |
| D+ | 67-69 |
| D | 63-66 |
| D- | 60-62 |
| F | 59 and below |

Zoom Etiquette

We are all adjusting to the online learning environment. For me and many of you this will be our first experience interacting in a virtual classroom. A few reminders for online lecture/discussion:

- PLEASE NOTE: synchronous session will be recorded and distributed on Blackboard since we may be experiencing extenuating circumstances like living in different time zones or other challenges, however live attendance is always encouraged if possible
- Sharing course materials outside the learning environment is prohibited under USC policy (*SCampus Section 11.12(B)*)
- Please mute your mic when not speaking
- Use of webcam is encouraged and preferred, just remember to be properly attired (I know people who have accidentally attended a work meeting shirtless during the summer heat, just saying...) and use backgrounds if you'd prefer some more privacy
- If you are unable to keep their camera on during a synchronous Zoom session, please contact me prior to the class session to discuss expectations and accommodations needed
- If you live with others, headphones with a mic might be helpful
- As long as you can focus, eating is totally fine – we may be coming from all different time zones/schedules
- Please do your best to focus on our class discussion, avoiding browsing social media/internet
- You can use the chat box or hand raising feature to ask questions during lecture or comment during discussion
- Come to synchronous meetings prepared
- We are all under extra pressure during this unusual time, please be thoughtful and respectful towards your classmates and me; more on that in the next section

Classroom Groundrules

Below is a brief summary of ground rules and expectations for our classroom. You can find a more comprehensive version of this list on the Environmental Studies Program website.

- Share responsibility for including all voices in the conversation
- Listen respectfully
- Be open to changing your perspectives based on what you learn from others
- Understand that we are bound to make mistakes in this space
- Understand that your words have effects on others
- Take pair work or small group work seriously
- Understand that others will come to these discussions with different experiences from yours
- Make an effort to get to know other students
- Understand that there are different approaches to solving problems

Course Schedule: A Weekly Breakdown

For the best learning experience, you are expected to have read assigned material and complete appropriate assignments or Blackboard participation modules by the date the topic is discussed in class. Article and supplemental readings will be posted online. *The readings and schedule of topics may be adjusted throughout the semester depending on progress of the class.*

| | Topics/Daily Activities | Readings | Deliverable/ Due Dates |
|--------------------------------|--|---|---|
| Week 1 Aug 18, 20 | -Course overview -Water as a chemical -Hydrosphere, Hydrological Cycle -Introduce COVID-19 food waste class project | WREI Ch 3 | |
| Week 2 Aug 25, 27 | -Watersheds, Water supply | WREI Ch 5 | Module 1 Semester Proj. BB Participation #1 |
| Week 3 Sep 1, 3 | -Water usage, treatment, & quality | WREI Ch 11, 12 | Article 1 reading guide BB Participation #2 |
| Week 4 Sep 8, 10 | -Water usage, treatment & quality cont'd -Fecal Indicator Bacteria: gauging drinking water & recreational water safety | WREI Ch 11, 12 See BB | Article 2 reading guide BB Participation #3 |
| Week 5 Sep 15, 17 | -Surface water & groundwater water dynamics | ENPS Ch 5, 6; WREI Ch 6 | Module 2 Semester Proj. BB Participation #4 |
| Week 6 Sep 22, 24 | -Surface & groundwater dynamics cont'd -Groundwater contamination | ENPS Ch 5, 6; WREI Ch 6 | BB Participation #5 |
| Week 7 Sep 29, Oct 1 | Take Home Exam, Midterm 1 -Soil science: development & properties | ENPS Ch. 1-2, Ch. 4 (4.1-4.5, 4.7, 4.8), Ch. 11 (11.4-11.8), 14 (14.1-14.3, 14.11, 14.13) | |
| Week 8 Oct 6, 8 | -Soil science: development & properties cont'd -Soil pH & salinity | ENPS Ch. 9 (9.1-9.3, 9.6, 9.7, 9.12-9.16, 9.18, 9.19) | Article 3 BB Participation #6 |
| Week 9 Oct 13, 15 | -Soil microbiomes & food web | ENPS Ch.10 (10.1-10.3, 10.10-10.12) | Module 3 Semester Proj. BB Participation #7 |
| Week 10 Oct 20, 22 | -Nutrient cycles: C, N, P | ENPS Ch 11, 12, 13 | Article 4 BB Participation #8 |
| Week 11 Oct 27, 29 | -Nutrient cycles: C, N, P cont'd | ENPS Ch 11, 12, 13 | Module 4 Semester Proj. BB Participation #9 |
| Week 12 Nov 3, 5 | -Environmental impacts of agriculture -Coastal pollution, eutrophication | | BB Participation #10 DIY Reading Guide Article Selection |
| Week 13 Nov 10, 12 | -Water/soil conservation in agriculture -Catch up | | DIY Reading Guide |
| Week 14 Nov 17 | Take Home Exam, Midterm 2 | | |

Statement on Academic Conduct and Support Systems

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 Part B, Section 11, "Behavior Violating University Standards" policy.usc.edu/scampus-part-b. 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>.

Distribution or use of notes or recordings based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study is a violation of the USC Student Conduct Code (*SCampus Section 11.12(B)*). This includes, but is not limited to, providing materials for distribution by services publishing class notes. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relationship to the class, whether obtained in class, via email, on the Internet or via any other media. (See *Section C.1 Class Notes Policy*).

Support Systems

Student Counseling Services (SCS) – (213) 740-7711 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. engemannshc.usc.edu/counseling

National Suicide Prevention Lifeline – 1 (800) 273-8255

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. www.suicidepreventionlifeline.org

Relationship and Sexual Violence Prevention Services (RSVP) – (213) 740-4900 – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. engemannshc.usc.edu/rsvp

Sexual Assault Resource Center

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: sarc.usc.edu

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086

Works with faculty, staff, visitors, applicants, and students around issues of protected class. equity.usc.edu

Bias Assessment Response and Support

Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. studentaffairs.usc.edu/bias-assessment-response-support

The Office of Disability Services and Programs

Provides certification for students with disabilities and helps arrange relevant accommodations. dsp.usc.edu

Student Support and Advocacy – (213) 821-4710

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. studentaffairs.usc.edu/ssa

Diversity at USC

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. diversity.usc.edu

USC Emergency Information

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible. emergency.usc.edu

USC Department of Public Safety – UPC: (213) 740-4321 – HSC: (323) 442-1000 – 24-hour emergency or to report a crime.
Provides overall safety to USC community. dps.usc.edu