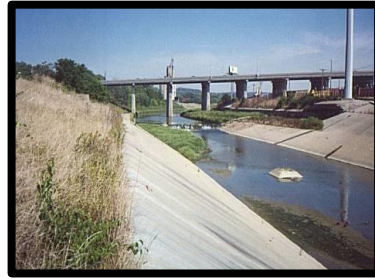


EVST 4011 - Fall 2015
Advanced Topics in Environmental Studies: WATER



TIME AND LOCATION

Weds. 1:25 - 5:35 PM (field trips); 1:25 - 4:30 PM (classroom days)
Swift Hall Room 620 (except as noted for field trips)
Office hours by appointment

INSTRUCTOR

Dr. Ishi Buffam
731H Rieveschl Hall
ishi.buffam@uc.edu
556-9745

COURSE THEME AND APPROACH: The course is focused on urban water resources issues, and takes the form of an environmental case study of an urban stream, the Mill Creek in Cincinnati, from multiple disciplinary perspectives: historical, geographical, social/cultural, hydrological, chemical, physical, and planning. We will begin with an overview of global water resource issues and the historical development of urban water resources; Our Cincinnati case study begins with a retrospective look at the forces and history that have resulted in the Mill Creek of today, then we get to know the Mill Creek through field trips and current studies, and finish by envisioning the potential Mill Creek of the future. The format of the course is wide-ranging: All days will include time for discussion, but some days will also include lecture, some days will include in-class group activities, and some days will include off-campus field trips. The course will include guest lectures by several pre-eminent scholars and practitioners from both within and outside the University, as well as field trips to the creek itself and several important locations within the watershed.

LEARNING OUTCOMES: If you put your all into this course, you can expect to come away with the ability to do the following:

1. Identify the most pressing current water resource issues, locally and globally
2. Explain the hydrologic cycle at scales ranging from small watershed, to the globe
3. Describe and assess the importance of various threats to urban surface water quality
4. Assess urban water resource issues from multiple disciplinary perspectives
5. Carry out a basic assessment of stream ecosystem health, using evidence from physical, chemical and biological measurements
6. Appraise different approaches to management of urban storm water runoff and stream water quality, including grey infrastructure, green infrastructure, and stream restoration

7. Devise an original plan to address water resource issues specific to an urban watershed, in the context of other related environmental, social and economic issues

COURSE READINGS: Readings from the first part of the course will come from the required books (below) and will be supplemented by materials from a variety of sources. Supplementary readings can be found in the "Course Documents" folder on Bb, as pdf files or links to online documents. Reading for each topic should be read prior to coming to class, and will typically be covered in quiz questions either before or in class (note, for later dates in the course reading assignments will be updated periodically, usually well ahead of time but at latest by 1 week prior to class). **You are responsible for reading each day's assigned readings before coming to class.**

Required books:

- (1) **Hedeen**, Stanley. 1994. *The Mill Creek: An unnatural history of an urban stream*. (AVAILABLE IN UC BOOKSTORE) Blue Heron Press, Cincinnati. Dr. Hedeen is a Professor Emeritus from Xavier University, and will be making a guest appearance in our class during week three. Dr. Hedeen was originally trained as a biologist but has wide-ranging knowledge and is a great resource for all things related to the Mill Creek History.
- (2) **Sedlak**, David. 2014. *Water 4.0: The Past, Present and Future of the World's Most Vital Resource*. (AVAILABLE AMAZON.COM, \$12) Yale University Press, New Haven & London. Dr. Sedlak is a Professor of Engineering at the University of California, Berkeley, with research focusing on developing new approaches for managing the urban water cycle. He pursues these efforts through research coordinated through the National Science Foundation's Engineering Research Center for Reinventing the Nation's Urban Water Infrastructure (ReNUWIt: <http://www.renuwit.org/>) and the Berkeley Water Center (<http://bwc.berkeley.edu/home/>).
- (3) **Holden**, Joseph. 2014. *Water Resources: An Integrated Approach*. (eBOOK THROUGH UC LIBRARIES HOMEPAGE, free). Dr. Holden is a Professor of Hydrology at Leeds University in England. He studies the hydrology and carbon dynamics of peatlands under environmental change, and is also a member of a water and agriculture taskforce that reports to the UK government.

EXPECTATIONS FOR STUDENTS:

1. Students will attend all classes unless a valid excuse is presented in advance of class, and barring extenuating circumstances
2. Students will be prepared for class and participate fully in class activities
3. Students will arrive for class, be in their seats, and ready to begin on time. Students will stay until the end of class and will not pack up before that time.
4. Students will turn off all music, communication, and game devices during class. Laptops/tablets can be used only for class-related activities. If you need to be reached on an emergency basis (e.g. medical professional on call or kids in day care), let me know ahead of time.
5. Course-related email will include EVST 4011 in the subject line
6. Students will be respectful and civil with other students, the professor, and class guests.
7. Students will conduct themselves with personal integrity and honesty.

WHAT YOU CAN EXPECT FROM YOUR PROFESSOR:

1. I will be prepared for class, and start and end the class on time.
2. I will do my best to make sure class time is valuable to the students who attend.
3. I will abide by the grading scale and course policies listed in the syllabus.

4. I will answer email questions from students within 24 hours, during the work week.
5. I will listen to in-class questions from students and will address them thoroughly, if relevant to the topic being discussed. If I do not know the answer, I will do my best to find it out and report back.
6. I will be respectful, civil, and professional in my dealings with students.

BASIS FOR GRADES: Grades will be based on class participation, quizzes and assignments, an exam, and a final project which involves investigative reporting, an in-class presentation, and a term paper. Relative weight will be assigned as described below.

Attendance and Participation:	_____	30%
Quizzes and Assignments:	_____	30%
Project - Group Presentation	_____	10%
Project - Paper	_____	30%

Your final grade will be determined by summing credit for all of the above, with the grade breakdown planned as follows.

Letter Grade	Percentage
A	93-100%
A-	90-93
B+	87-90
B	83-87
B-	80-83
C+	77-80
C	73-77
C-	70-73
D	60-70
F	<60

Attendance and Participation: This is a very important part of the class, and is reflected in the high weight in grading. As we only meet once per week, attendance is expected. In-class activities will count towards participation, as will contributing to discussion, asking questions of speakers, etc. Generally, all students present will get credit for participation if class participation is high. When we have guest speakers for instance, I anticipate that we will have a number of students asking questions during Q+A. If participation is low on a given day, only students who actively participate will get full credit.

Quizzes and Assignments: There will be quizzes most weeks, covering the assigned readings or material discussed in class. These will be typically offered in class using PRS clickers (see below). Periodic out-of-class assignments will be due at the beginning of class on the due date. Details will be supplied both in class and on the Bb site.

PRS "Clickers": We will be using Turning Point PRS clickers for rapid response feedback and quizzes during class. Make sure that you have a clicker that you can use (available at the UC bookstore if you don't already have one), register it on the class Bb site, and set it to channel 65 for use in our classroom.

Project - Group Presentation and Paper: At the beginning of the course, small groups (typically 3-5 students) will be formed and each group will define a specific water resource issue for the Mill Creek watershed that they will perform extensive research on, and carry out a research project on, culminating in

a term paper and a 20-minute presentation in class. The goal of the project is to generate and articulate a plan to improve the situation in Cincinnati related to their chosen water resource issue. The project is expected to integrate many of the different environmental perspectives that we will cover in class: historical, legal, engineering, hydrological, water chemistry, aquatic biology, assessment, restoration/green infrastructure, policy, environmental justice. However students can choose to focus their project primarily in areas that are of particular interest to them. All projects should describe in detail: (1) the relevant historical background and context in which the water resource issue arose; (2) the current state of affairs relative to the issue; (3) relevant policy/laws; (4) existing barriers which continue to make the issue a problem for the Cincinnati area; (5) approaches that have been tried (either here in Cincinnati or elsewhere) and how they fared; (6) a plan/proposed solution for the Mill Creek. The bulk of the paper should be devoted to developing the plan/proposed solution. Project ideas will be supplied, but groups are encouraged to define their own project focus, subject to approval by instructor. Example project goals: "Optimize the Mill Creek for healthy, diverse fish communities", "Optimize the Mill Creek and watershed for flood control", "Optimize the Mill Creek for recreation in the water", "Develop a K-8 Learning Module related to the Mill Creek and specific water resource issues".

Field Trips: We will have field trips periodically during class time (see course schedule below), as well as a few field trips outside of normal class time. On these days, it is your responsibility to either (1) meet at the classroom, on time, for transportation to the field trip with the class bus, or (2) arrange with the instructor to meet us at the field trip destination. Information on field trip destinations will be available on the Bb site. You must choose your mode of transportation by class the week before and sign up as outlined by the instructor in class.

Field Trip #1: Canoe Mill Creek (Weds or Saturday Option): Early on in the course, we will all be taking a canoe trip down the Mill Creek, through the heart of Cincinnati, hosted by the Mill Creek Yacht Club: <http://millcreekwatershed.org/know-the-mill-creek/mill-creek-yacht-club/>. We will be going out into the creek and potentially getting wet, wear field-appropriate clothes. There are two options for the field trip: Wednesday Sept. 2 during the regular class period (1:25PM - 5:35PM), or Saturday, Sept. 5 (Approx. 8:30AM - 12:30PM). I will send around a sign-up sheet on the first day of class, so that you can choose which day to go; we'll need about half the class to go on each one. Note, if you choose the Saturday field trip, you will have a free afternoon on Sept. 2 (no class). **There is a \$20 cost per student for this trip – covers the cost of logistics, and a Mill Creek Yacht Club t-shirt.

Field Trip #2: Monitor Health of Mill Creek (During normal class time Weds Oct. 7): We will be going out into the creek with the help of Groundwork Cincinnati – Mill Creek (<http://groundworkcincinnati.org/>) and potentially getting wet, wear field-appropriate clothes.

Field Trip #3: Green Infrastructure and Stream Restoration demonstration sites (During normal class time Weds Oct. 28). Hosted by Civic Garden Center of Greater Cincinnati's Green Learning Station (<http://greenlearningstation.org/>) and Warren High (AMEC) who will take us on a tour of a restoration site at Twin Creeks Preserve: <http://millcreekwatershed.org/what-we-do/projects/twin-creek-preserve/>.

Field Trip #4: City Water Infrastructure: There will be an opportunity to sign up for one of the following three field trips on Weds. Oct. 14: (1) Greater Cincinnati Water Works' Miller Plant (Drinking water treatment plant); (2) Greater Cincinnati Metropolitan Sewer District's (MSD) Gest. St. Wastewater Treatment Plant; (3) A tour of stormwater runoff management strategies, led by MSD and highlighting the Lick Run Watershed.

ADDITIONAL COURSE INFORMATION: EVST 4011

Class information and communications will be disseminated online through Blackboard. It is your responsibility to stay informed of any Bb communications or assignments, and to download and read the required readings prior to the beginning of class.

The work you will do in this course is subject to the University of Cincinnati Code of Conduct. The Code of Conduct is a commitment to the highest degree of ethical integrity in academic conduct, a commitment that, individually and collectively, the students of the University of Cincinnati will not lie, cheat, or plagiarize to gain an academic advantage over fellow students or avoid academic requirements. While we will sometimes work in groups, you will prepare your assignments independently unless otherwise indicated by the instructor. If you are unsure about the rules for a particular assignment, it is your responsibility to ask the instructor. The Student Code of Conduct (SCOC) document can be accessed at: http://www.uc.edu/conduct/Code_of_Conduct.html. FYI, several types of academic misconduct are defined in the Course Documents folder ("General" subfolder) on Bb.

Special Needs Statement: If you have any special needs related to your participation in this course – including identified visual, hearing or physical impairments, a communication disorder, and/or a specific learning disability that may influence your performance in this course – please contact me to arrange for reasonable provisions to ensure an equitable opportunity to meet all course requirements. Some accommodations may require prior approval by Disability Services (513-556-6823).

COURSE SCHEDULE:

Date	Topic	Readings for Class	Assignments Due
8/26	WEEK #1. Introduction to Water Resource Issues and the Mill Creek Watershed (<i>Guest: Kara Scheerhorn, Mill Creek Watershed Council</i>)	Pennington & Cech Ch. 1	Water resources article for discussion
9/2	WEEK #2a. Wednesday FIELD TRIP, Meet in class - Canoe Lower Mill Creek, Put-In at Mill Creek Rd. Yellow Bridge (Group A)(<i>Host: Mill Creek Yacht Club</i>)	Hedeen Ch. 1-4; Sedlak Ch. 1	Online questions before class
9/5-SAT	WEEK #2b. FIELD TRIP, Meet at field site or at CRC circle if arrange ride - Canoe Upper Mill Creek, Put-In at Twin Creeks Preserve, Sharonville (Group B) (<i>Host: Mill Creek Yacht Club</i>)		
9/9	WEEK #3. History of the Mill Creek (<i>Guest: Dr. Stan Hedeen</i>); History of Urban Water Resource Issues	Hedeen Ch. 5-7; Sedlak Ch. 2-3	List of potential project topics
9/16	WEEK #4. Approaches to Urban Watershed Planning and the role of Engineering (<i>Guest: Dr. David Stradling</i>); Group Project Work	Hedeen Ch. 8-11; Revive 75 Plan; Tunnel Plan (Ex. Summary + Ch.9)	Short response essay
9/23	WEEK #5. Group Project Work; Hydrologic cycle; Changing water balance in Mill Creek Watershed (<i>Guest: Dr. Steve Buchberger</i>)	Hedeen Ch. 12-14; McCoy-Simandle et al.; Holden Ch. 3	Final Project idea
9/30	WEEK #6. Water Quality and Assessing stream ecosystem health; Current assessment of Mill Creek (<i>Guest: Dr. Mike Miller</i>); Group Project Work	Holden Ch. 4; Holden Ch. 6	Project proposal
10/7	WEEK #7. FIELD TRIP, Meet at Campus Rec Ctr. Circle to take bus: Monitoring Health of Mill Creek Main Stem - At Caldwell Park (<i>Host: Groundwork Cincinnati - Mill Creek</i>)	MBI Mill Creek Assessment 2011; Ohio Bioassessment Criteria; Instructions for Field Work	Meet with instructor to discuss project proposal
10/14	WEEK #8. Drinking Water and Wastewater treatment; FIELD TRIPS (3 options), meet in class	Sedlak Ch. 4-5	Questions from Modules A-D ; Annotated Bibliography for Project

10/21	WEEK #9. Urban Green Infrastructure; Stream Restoration (<i>Guest: Warren High, AMEC & Cinc. State</i>)	Sedlak Ch. 7; Stream Corridor Restoration Ch. 1; Project Groundwork Website
10/28	WEEK #10. FIELD TRIP, Meet at Campus Rec Ctr. Circle to take bus: Urban Green Infrastructure and Stream Restoration - Civic Garden Center and Twin Creek Preserve (<i>Hosts: Kylie Johnson, Civic Garden Center; and Warren High, AMEC</i>)	Sedlak Ch. 12; Websites: GLS, Twin Creeks, and EPA-Green infrastructure
11/4	WEEK #11. Water Rights, Water Policy, Water Law, Regulations (<i>Guest: Dr. Eric Maurer</i>); Group Project Work	Holden Ch. 11; Andreen 2013
11/11	NO CLASS - VETERANS DAY	
11/18	WEEK #12. Student Project Presentations and Discussion Part I	
11/25	NO CLASS - THANKSGIVING	
12/2	WEEK #13. Student Project Presentations and Discussion Part II	
12/9	FINALS WEEK: No class, but Final Group Project paper (term paper) due by midnight on Bb	

****NOTE:** This syllabus is subject to change, but I will keep you informed of any substantive changes I make. When we have out-of-class assignments, these are due at the beginning of class, with -10% per day late.