

The Hydrologic Impact of Urbanization

GEOG 675/ENVS 684 Tuesday 6-9pm Linthicum 014

Contact Information:

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Office Hours: Tuesdays, 3-4pm, Thursdays 2-4pm, or by appointment.

Optional Textbooks:

- Davie, Tim. 2002. *Fundamentals of Hydrology*. New York: Routledge.
- Gordon, Nancy D., Thomas A. McMahon, and Brian L. Finlayson. 2004. *Stream Hydrology: an introduction for Ecologists*. 2nd ed. New York: John Wiley and Sons.

Use these books to help yourself get up to speed if you have had no hydrology or fluvial geomorphology training. I highly recommend them, and they make great references to keep on the shelf.

Course Websites:

- bbweb.towson.edu: *register for this site. I post your grades for assignments here.*
- robergeseminar.wiki.zoho.com: *this will be our main site. We'll use it every week.*

Important Dates:

Tuesday, January 27th: first class.
Tuesday, March 17th: Spring Break, no class.
Tuesday, March 24th: Roberge to conference; no class.
Monday, April 6th: last day to withdraw.
Tuesday, May 12th: last class/last day to turn in materials.

Course Description:

We will be learning the basics of hillslope hydrology, stream hydrology, and fluvial geomorphology through supplemental textbook and seminar discussions, lectures, and assignments. We will investigate more advanced concepts (Do stream banks really equilibrate to a flood with a recurrence interval of one year?) and applied topics (the effects of urbanization; stream restoration) through a seminar-style reading of peer-reviewed journal articles, and by conducting primary research on these topics using local field sites and by collecting our own data. By conducting primary research, we will gain experience with the typical cycle of modern scientific activity. That is, we will work with multiple authors, develop research questions, explore the literature, formulate the methods, collect the data, present the results, and disseminate our findings to a larger audience.

Objectives:

At the end of the semester, students will be able to:

- understand the basic processes of hydrology (precipitation, rainfall/runoff, stream hydrology) and fluvial geomorphology.
- discuss fundamental hydrologic and geomorphic theories and applied issues.
- formulate a research problem.
- collect field data.
- conduct basic hydrologic and geomorphic analyses.
- present their work to a scientific audience in a written, oral, and poster format.

Course Structure:

This course will be composed of three parts. 1) We will be learning the basics of hydrology and fluvial geomorphology through textbook readings, class lectures, classroom exercises, and homework. 2) We will learn about more advanced or applied topics through the seminar model: we will read journal articles and join in an in-class, student-led discussion. 3) We will learn by doing: the class will participate in several research projects, with weekly research and writing assignments. Every student will get a chance to do some field research, and every student will submit a paper involving primary research.

Student Responsibilities:

Students will be responsible for: 1) Every student will be responsible for reading and discussing the seminar articles (these will be distributed online along with a reading guide the week prior to discussion); students will be responsible for leading at least two seminar discussions and preparing the accompanying reading guide. 2) Every student will be responsible for participating in the class research projects. These projects will require each student to complete weekly research assignments, at least one day of field work, an original analysis of data, and a research paper that summarizes your work.

Reading Expectations:

As a reader, you are expected to come to class with notes on each paper, and to participate in the discussion. As you are reading, try to find something in common between all of that topic's readings, and try to draw out some of the larger issues. Some of the questions that you might try to answer are: What kind of paper is this (a review, research, policy...)? What questions were the authors asking? What methods did the authors use to answer their questions? Are any of the authors associated with a particular point of view, or have they taken sides in a debate? Do you agree with the author's findings? What are the paper's weaknesses? Are there any flaws in the author's methods, analysis, or research findings? *Expect to spend 2 hours reading outside of class for every hour you spend in class.*

Facilitator Expectations:

As the facilitator, it is expected that you will: 1) Meet with me well in advance to discuss your topic and select the papers to be read. 2) Create an annotated bibliography of the papers, complete with discussion questions. 3) Distribute copies of the reading

materials and your annotated bibliography the week before your topic is due. 4) Briefly (<15 minutes) introduce the topic. 5) Facilitate the discussion.

See my instructions on 'how to write a reading guide' on the website.

Research Expectations:

The research project/projects will be designed in class as a group and led by the professor, or in some cases by a graduate student. Students will be assigned to a project, and may end up switching projects at the discretion of the professor. These projects will require each student to weekly research assignments that will be assigned in class.

Everyone will be required to do some fieldwork, but not every project has a field component (for example, an analysis of stream discharge data). Some projects will require large amounts of help in the field. To fix this imbalance, everyone will spend at least a day in the field, helping with one of the projects.

Academic Integrity:

Students are expected follow the student Code of Conduct (Appendix D in the Graduate Catalog). Violations include plagiarism, fabrication or falsification, cheating, complicity in academic dishonesty, abuse of academic materials, and multiple submissions of materials. Descriptions of these violations are in the Academic Integrity Policy, in the definitions section. I will penalize students who violate the code of conduct with an 'F' for the course or with an 'F' for the assignment, at my discretion, and with a letter to the Office of Judicial Affairs.

Assessment:

The work of this class is broken into two parts, with the overall course grade determined 50% by the seminar and 50% by the research portion of the course. A sample assessment chart is included below; each assignment or responsibility listed in this chart will be assessed according to the following scheme:

- A** The student has exceed my expectations; student conferred with professor to the extent necessary to satisfactorily complete the work; if the assignment was critical to the rest of the class, the student allowed time to make corrections; the work was completed and turned in early and was well done.
- B** The student completed the assignment on time and well.
- C** The student completed the assignment, but caused problems for the other students or for the professor by turning it in slightly late, or on time but needing last-minute corrections.
- ZERO** The student did not complete the assignment, or completed a critical assignment late, jeopardizing the well-being of a research project or seminar discussion.

Assessment Chart

Seminar: (50%)

	How well did the student master the readings? (<i>assess for each week</i>)
	How well did student participate in classroom discussion? (<i>assess for each week</i>)
Leading a Seminar Topic. <i>topic:</i> _____ <i>date:</i> _____	
	Did the student meet with the professor to discuss the readings before the readings distribution date?
	Did the student collect and distribute all of the readings?
	How well did the student prepare the topic guide?
	How well did the student lead the class discussion?

Research: (50%)

	Bibliography and Library Research
	Introduction and Problem Formulation
	Methods & Data Collection
	Analysis & Discussion
	Presentation of research