GCH 103 (Honors): Grand Challenges in the Natural Sciences
A River Runs Through It

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Class: T/Th 9:30am-10:45am, Lippitt 201
Office hours: Th 11am-12pm, Coastal Institute 109, or by appointment

"All there is to thinking is seeing something noticeable which makes you see something you weren't noticing which makes you see something that isn't even visible."
Norman Maclean, *A River Runs Through It*

"The river has taught me to listen; you will learn from it, too.
The river knows everything; one can learn everything from it."
Herman Hesse, *Siddhartha*

This is a class about rivers. Which means that you'll learn about things like hydrology and aquatic life, and about the people who use them. It's also a class about a grand challenge: in this case, the challenge of providing for competing uses of freshwater resources and maintaining the health of our nation's waterways despite increasing pressures. As a designated grand challenges course, this class should "help students build a foundation for lifelong learning and a thoughtful engagement with the world." While focused on natural science, the course is intentionally interdisciplinary, as the world's complex problems demand transdisciplinary solutions.

The care of Rhode Island's rivers is up to you and your classmates. If you take advantage of it, your URI experience can equip you to deal with the increasingly wicked problems your generation will face.

This class is partly about content, but even more it is about learning to ask good questions, finding appropriate ways of answering those questions, and taking action with your answers. It is about going out and experiencing Rhode Island, getting dirty, engaging with classmates and community members, discovering new insights, and intervening in the world. It is about thinking, which is about learning to see: "seeing something noticeable which makes you see something you weren't noticing which makes you see something that isn't even visible."

Remember: "The river knows everything; one can learn everything from it."

Course goals:

- Learn about watersheds, rivers, and dams.
- Engage with the multiple dimensions of our Rhode Island landscape.
- Integrate ecological and social knowledge.
- Work collaboratively to solve problems.
- Give a shit about something! And act on that passion.

What we'll do:

- Go places and see things. Interact with the natural and built environment. Be outside (possibly even in the rain). Engage with experts.
- Read, watch, and learn about the practice of river restoration, the history of Rhode Island rivers and dams, the narratives of rivers and dams, and the science of watersheds, rivers, dams, and migratory fish.
- Write a lot about what you're learning and seeing. Ace some quizzes.
- Discover new information about Rhode Island river restoration projects that could actually help people make better decisions in the future about Rhode Island's dams.
- Take action in our on- and off-campus communities.

What Gen Ed integrated skills you'll practice:

- Read complex texts
- Speak effectively
- Use information technology
- Write effectively

What Gen Ed learning objectives you'll meet:

- Identify basic concepts, theories, and developments
- Ask questions appropriate to the modes of inquiry
- Collect information relevant to the questions raised
- Analyze information in order to address the questions or solve problem

Specifics:

This class will meet Tuesdays and Thursdays throughout the semester. We will also meet for a few out-of-class activities around campus. In addition, you will complete a number of self-directed field activities. For transportation, the RIPTA #66 bus travels directly south from the Student Union to the Main St. bridge over the Saugatucket River in Wakefield. You may want to carpool, ride bikes, or use the RIPTA for other self-directed field visits. I will help you navigate public transportation to get where you need to be.

You will need:

- writing materials for in-class activities
- a laptop, iPad, or access to a printer to bring course readings with you to class
- an internet connection to access our course web site < http://seacomm.weebly.com/gch-103.html> for readings and information
- a smartphone or camera for photos during self-directed visits
- a bus pass or bus money
- a healthy tolerance for getting dirty and wet and for taking smart risks

Grading:

Engagement (diligent participation, respect for others, and completion of all activities)	10%
Reflection papers (8 papers @ 2 points each)	16%
Quizzes (3 quizzes @ 3 points each)	9%
White Horn Brook action (group project) + individual reflection	20%
Restoration snapshot (group project) + individual reflection	20%
Action project (individual or group project) + individual rhetorical analysis	25%

URI Grading Scale:

A 93 / A- 90 / B+ 87 / B 83 / B- 80 / C+ 77 / C 73 / C- 70 / D+ 67 / D 63 / F 59

Description of Major and Minor Projects:

Engagement (10% of total grade)
Ongoing
Engagement includes regular attendance, diligent participation, oral presentations, respect for others, and completion of all activities. Being here is not enough. All of us need to be present, actively participating in the class and interacting with each other. Showing up nets students 5 pts. Periodic participation nets students 7 pts. Active engagement nets students the full 10 pts.

Reflection papers (8 papers @ 2 points each) (16% of total grade)
Tuesday, Sept. 15, Water you love reflection
Tuesday, Oct. 6, White Horn Brook visit reflection
Tuesday, Oct. 20, Saugatucket River documents synthesis
Tuesday, Oct. 20, Saugatucket River visit reflection
Tuesday, Nov. 3, Dam site visit reflection
Tuesday, Nov. 10, DamNation reflection
Thursday, Nov. 12, Group project reflection
Thursday, Dec. 3, Synthesis of restoration snapshots
These reflection papers are typically 1-3 pg. typed responses that allow us the chance to think more about specific readings, process what we've seen on self-guided visits, or prepare for in-class discussion. These documents are essential to pulling together the diverse disciplines and perspectives we're trying to cover here.

Quizzes (3 quizzes @ 3 points each) (9%)
Tuesday, Sept. 22, Watershed ecology quiz
Thursday, Sept. 24, Watershed change quiz
Tuesday, Sept. 29, Stream corridor quiz
These quizzes allow us the chance to demonstrate our learning of the fundamental watershed processes that the course builds upon. These quizzes are compact but important, setting the ecological stage for the synthesis that happens later in the course. Understanding these technical readings will be essential to completing the restoration snapshots in November.

White Horn Brook action (group project) + 5 pg. individual reflection (20%)
Tuesday, Oct. 13, White Horn Brook group action and individual reflection
On Tuesday, Sept. 29, we'll take a tour of our campus watershed with Professor Art Gold, followed by a field visit on Thursday, Oct. 1 to White Horn Brook (on campus) with Professor Laura Meyerson, and a weekend self-guided tour of the lower reaches of White Horn Brook. These field visits will give you a chance to learn about URI's White Horn Brook and consider, in working groups, an appropriate intervention on behalf of the Brook. With your group, you will be expected to design and implement an action of some kind. You can use your creativity to determine what that action should be. Then, individual group members will write up a personal reflection about the project and defense of the action taken.

10 pg. restoration snapshot (group project) + 4 pg. individual reflection (20%)
Thursday, November 12, Group conferences with Dr. Druschke to discuss snapshot ideas and plans
Tuesday, December 1, Group restoration snapshot and individual reflection (and presentation of snapshot)
On Thursday, Oct. 29, in lieu of class, you and your working group will travel to a dam or dam removal site around Rhode Island. Your group will conduct research into the site, working to synthesize ecological, hydrological, social, and economic information about the site. You will then work as a group to create a restoration snapshot that highlights the site and the restoration work that has gone on there. The point of this project is to build up our collective knowledge about dams and dam removals in the state and to consider what can be learned by comparing those sites. Individual group members will then write up a personal reflection about the project and her role in it.

Action project (individual or group project) + 6 pg. individual rhetorical analysis (25%)

Thursday, December 3, Group workshop

Tuesday, December 8, Feedback on action plans

Tuesday, December 15, Action project and individual rhetorical analysis

The culmination of this class is an action project that will emerge, in part, out of your work on White Horn Brook action and the restoration snapshot. This action can be taken individually or in a group, but either way students will write individual rhetorical analyses of their work. We can think of the White Horn Brook action as a test run, and the restoration snapshot as a chance to engage much more deeply with restoration work in Rhode Island. This final action project is your chance to "give a shit about something": to find some way to engage in an activity you care about for an audience that moves you. The point here is not for you to satisfy Dr. Druschke with your action, but, instead, to find something that YOU can be passionate about, to take action on that passion, and to justify your choice. The "A" action will be inspired and consequential for a particular target audience, and it will build from interdisciplinary perspectives. Remember, this class is about grand challenges related to rivers and these action projects will need to grapple with all of the complexity that entails.