

## **Take Me to the River! The Ecology and Conservation Needs of Aquatic Ecosystems**

FYOS Fall 2014

Class meets on Tuesdays 5-6:15pm, Ecology Room 117

### **Instructors:**

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**Course description:** The objectives of this course are to increase awareness and understanding of the conditions and threats to river systems. In doing so, we will explore the roles of university-based research, service and teaching in regards to river ecology and conservation. We will explore pressing conservation issues for river systems around the globe and observe first-hand how these issues play out locally. We will explore how 'rivers work' through reading and reflecting on current research findings and will explore the ecology of local rivers. We will learn about the major threats to aquatic ecosystem health, such as eutrophication, invasive species, climate change, the urban stream syndrome and explore concepts such as the natural flow regime, ecosystem services, and 'peak water'. We will learn about the amazing organisms that provide critical functions in river systems and will go to local rivers for study and appreciation of these ecosystems and to engage in conservation activities. This odyssey will include discussion and writing reflections of conservation issues and ecological threats, introduction to research approaches, participation in a river clean-up and will include a paddling trip on a local river.

**Course materials:** Published papers and other web-based material will be accessible via ELC.

### **Grading:**

1. Reading responses and other written assignments (**40%**). There will be seven of these, each roughly one page in length. They will be scored on a scale of 1-10.
2. Discussion and discussion leads (**30%**). This covers attendance, participation in the class, and co-leading one discussion.

3. Activities (5%). You are asked to participate in 2 activities. One is mandatory-- the volunteer stream sampling event on Sunday October 21.
4. Personal reflection paper (25%). Please keep an electronic journal during the course. Use this paper to synthesize your journal entries to document your journey in understanding aquatic ecosystems and your connections to community this fall. As part of the reflection paper, report the events you attended during the semester (see below), and try to make connections between the events and the concepts discussed in the class. Papers will be graded for quality of writing (grammar, punctuation) and synthesis of concepts. Additional guidelines will be provided and discussed in class. Suggested length is approximately 4 pages.

**Events:** As part of the FYOS, you are required to attend three UGA-sponsored events over the course of the semester. Events can include lectures, cultural or sporting events; some are listed on the FYOS site: <https://fyo.uga.edu/BrowseEvents.aspx>.

**Activities:**

Activity #1. A paddling trip down the Middle Oconee River (August 23). This is not required but will be an important introduction to the course and will be lots of fun—please attend!

Activity #2. Monitoring of local streams with UOWN, a volunteer conservation organization (October 21). This is a required part of the course. If you have an unavoidable conflict we will arrange an alternative assignment for you.

### **Course schedule Fall 2014**

**Aug 19. Topic:** Course overview and discussion: challenges in meeting ecological and societal needs for freshwater.

**Prior to class:** Read The Threats To Our Drinking Water by David Beckmanaug, New York Times Op-Ed (posted on elc)

**Bring to class:** Reading response with discussion points due.

**August 23 (Sat) Activity #1.** Float the Middle Oconee River!

<http://www.bigdogsontheriver.com/river.html>

**Aug 26. Topic:** Aquatic biodiversity in the Southeast- an imperiled resource.

**Prior to class:** Think about some of your favorite freshwater organisms and find out some specific information about their ecological requirements and what threatens their persistence, if anything. Start by selecting a *family* (i.e., the taxonomic unit) of fish, mussels, snails, insects, or other aquatic organism that occurs in the Southeast, and then choose a species within that family that is threatened or endangered. Write a one paragraph summary of the family and of the species, including the threats to the species (so, two paragraphs total).

**Bring to class:** Your two paragraphs. Be prepared to convince others why your selected family is important, and why your species is worth protecting.

**Sept 2. Topic:** The global decline in amphibians.

**Prior to class:** Read Connelly et al. 2008. Changes in stream primary producer communities resulting from large-scale catastrophic amphibian declines: can small-scale experiments predict effects of tadpole loss?

**Bring to class:** Reading response with discussion points.

**Sept 9. In class video: RiverWebs.** Popcorn provided!

**Sept 16. Topic:** Tropical streams and rivers—Differences and similarities with temperate streams. Plus: study abroad opportunities.

**Prior to class:** Macroinvertebrates are used as indicators of stream health in Georgia and in Costa Rica.

Compare these two guides:

[http://www.georgiaadoptastream.com/Manuals\\_etc/Bio\\_Chem/Macro\\_Key.pdf](http://www.georgiaadoptastream.com/Manuals_etc/Bio_Chem/Macro_Key.pdf)

<http://intranet.catie.ac.cr/intranet/posgrado/MC506/Bioindicadores%20-calidad%20del%20agua-Guia%20clasif.pdf>

Prepare a reading response that explains why macroinvertebrates are used as indicators, and list some of the taxa that are used as indicators of good and bad quality in Georgia. Try to do the same for Costa Rica, and describe any major differences you see. We don't expect you to read Spanish, but you should be able to puzzle out some similarities *and differences* from the pictures.

**Bring to class:** The reading response, and be prepared to discuss possible differences between temperate and tropical streams.

**Sept 23. Topic:** Connections between land and water

**Prior to class:** Read Walters, D.M., K.M. Fritz, and R.R. Otter. 2008. The dark side of subsidies: adult stream insects export organic contaminants to riparian predators. Prepare a reading response and discussion points based on the RiverWebs video and the Walters et al. paper.

**Bring to class:** Reading response with discussing points.

**Sept 30. Topic:** Aquatic research.

**Prior to class:** Find a graduate student or faculty member at UGA working on a freshwater research project. Talk to them by email, phone or in person to learn about their project, and write up a short description of it. Explain what they're studying, why it matters, their research questions or objectives, and how they're trying to address them.

**Bring to class:** One-page summary of a graduate student or faculty research project. Be prepared to explain it!

**Oct 7. Topic:** Rivers and streams in popular music.

**Prior to class:** Readings of short case studies (will be posted on elc the previous week).

**Bring to class:** Reading response based on case studies.

**Oct 12.** Upper Oconee Watershed Network stream sampling event. <http://www.uown.org/>

Attend Upper Oconee Watershed Network's quarterly sampling event and get to know your local streams!

**Oct. 14.** No class. Your UOWN activity on Sunday, October 12<sup>th</sup> takes the place of class this week.

**Oct. 21.** Last class. **Topic:** Dams, dam removal, and river restoration.

Prior to class: A couple of readings will be provided closer to the time.

Bring to class: Nothing—use this opportunity to work on your personal reflection paper.

**Oct. 28.** Personal reflection paper due! No class—submit the paper electronically.

### **Objectives of this course**

- To increase understanding of how aquatic ecosystems function
- To increase understanding of the current threats to aquatic ecosystems
- To explore solutions to specific threats to aquatic ecosystems
- To gain hands on experience with aquatic ecosystems
- To identify research, outreach and teaching related to aquatic ecosystems associated with UGA and that is currently being undertaken globally

### **Objectives of the FYOS**

This seminar is a component of the First-Year Odyssey Seminar program. The objectives of the overall FYOS program are to:

- enhance student-faculty interaction in a small class setting
- engage students in academic dialogue through writing, revision, and resubmission
- open channels of communication between students and faculty
- develop students' skills for creative thought and effective reasoning
- promote intentional and reflective learning
- expose students to opportunities to engage in research, public service, and varied forms of instruction both on campus and globally (e.g. study abroad, practicums, internships)
- expose students to events that highlight the mission of the University

### **Academic Honesty**

UGA's Honor Code:

"I will be academically honest in all of my academic work and will not tolerate academic dishonesty of others." As a University of Georgia student, you have agreed to abide by the University's academic honesty policy, "A Culture of Honesty," and the Student Honor Code. All academic work must meet the standards described in "A Culture of Honesty" found at <http://ovpi.uga.edu/academic-honesty-at-uga>. Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation. Questions related to course assignments and the academic honesty policy should be directed to the instructor.

Most relevant for this course is that all your assignments must be written in your own words. Plagiarism is a very serious violation.

**Grading policy**

90-100 A

80-89 B

70-79 C

60-69 D