

GEOG-9119B

Monitoring of Riverine Systems

Instructor:

Dr. Adam G. Yates (adam.yates@uwo.ca)
Rm 2403 SSC, x85008

Course Schedule:

Monday - 1pm to 4pm (first class Sept. 11)
Seminars: Rm 1302
Labs: Rm 1302

Course Description:

Contemporary riverine principles are explored in the context of the development and execution of riverine monitoring. Methods of monitoring the physical, chemical and ecological status of rivers will be discussed with labs providing opportunities for practical experience in popular monitoring techniques. A presentation and formal written report detailing the findings of a review of an ongoing riverine monitoring program of the student's choice is expected.

Course Materials:

Course readings will draw upon a variety of sources from the primary and secondary literature and will be made available on 1 day reserve in the library. A full reading list will be provided in the first class of the term.

Methods of Evaluation:

Students will be evaluated on the basis of the quality of a report reviewing an existing riverine monitoring program. Reports will be due at the end of the term. Students will also be expected to present an overview and critique of the selected monitoring program to their peers during class near the end of the term. Evaluation of student participation during labs and discussions will also be evaluated.

Assignment Weights

Written Report (50%)
Oral Presentation (40% - includes peer evaluation)
Participation (10%)

Assignment Descriptions

Written Report: The report will describe the monitoring program, including its goals, scope, methods and end users. The report will also include a critique of the program assessing the strengths and weaknesses of the program and a judgement on whether the

program meets its stated goals and suggestions for how the program could be improved. The report will not exceed 10 pages double spaced (excluding references, tables and figures). Report grades will be based on the clarity, accuracy and quality of the program description and critique as well as the quality of the writing and formatting of the document. Reports will be due the final day of classes.

Oral Presentation: The presentation will provide an overview of the report covering both the program overview and critique. The presentation will be done in powerpoint and should be 20 minutes in length with a 10 min question period to follow. Presentations will be graded by both the instructor and other students with average peer-evaluation accounting for 50% of the presentation grade. Presentations will be evaluated based on the presenter's knowledge of the topic, clarity, visual presentation quality, oral presentation skills and ability to answer questions. Presentations will occur the second last week of classes.

Participation: The participation grade will be assigned on the basis of attendance and engagement in class discussions and labs, as well as asking quality questions of the presenters.

Course Schedule:

- Week 01: Seminar 1 – class organization & reading list
- Week 02: Seminar 2 – riverine ecosystems
- Week 03: Seminar 3 – riverine ecosystems in populated landscapes
- Week 04: Seminar 4 – fundamentals of environmental monitoring
- Week 05: no class - reading week
- Week 06: Seminar 5 – monitoring of riverine systems
- Week 07: Lab 1 – watershed description using ArcHydro
- Week 08: Lab 2 – water chemistry, stream hydrology, and aquatic habitat sampling
- Week 09: Lab 3 – stream metabolism sampling
- Week 10: Lab 4 - benthic invertebrate sampling and processing
- Week 11: Lab 5 – algae and fish sampling
- Week 12: student presentations
- Week 13: no class – reports due

Reading List

Week	Readings
Week 1	No Readings
Week 2	Thorp et al. (2008) <i>The Riverine Ecosystem Synthesis: Towards Conceptual Cohesiveness in River Science</i> . Academic Press, San Deigo, USA. (Chapters 2 and 3) Further Readings: Vannote et al (1980) The river continuum concept. <i>Canadian Journal of Fisheries and Aquatic Sciences</i> , 37:130-37. Statzner & Higler (1986) Stream hydraulics as a major determinant of benthic invertebrate zonation patterns. <i>Freshwater Biology</i> 16: 127-139. Frissell et al (1986) A hierarchical framework for stream habitat classification: viewing streams in a watershed context. <i>Environmental Management</i> , 12: 199-214.
Week 3	Allan (2004) Landscapes and riverscapes: the influence of land use on stream ecosystems. <i>Annual Review of Ecology, Evolution and Systematics</i> , 35: 257-284.

	Further Readings: Paul & Meyer (2001) Streams in the urban landscape. <i>Annual Review of Ecology and Systematics</i> , 32: 333-365. Carpenter et al (2010) Non-point pollution of surface waters with phosphorus and nitrogen. <i>Ecological Applications</i> , 8: 559-568.
Week 4	Wiersma (2004) <i>Environmental Monitoring</i> . CRC Press Boca Raton, USA. (Chapters 1, 4 & 17) Dale & Beyeler (2001) Challenges in the development and use of ecological indicators. <i>Ecological Indicators</i> , 1: 3-10.
Week 5	Dixon & Chiswell (1996) Review of aquatic monitoring program design. <i>Water Research</i> , 30: 1935-1948. Norris & Thoms (1999) What is river health?. <i>Freshwater Biology</i> , 41: 197-209.
Week 6	Kraemer & Panda (2009) Automating ArcHydro for Watershed Delineation. <i>Proceedings of the 2009 Georgia Water Resources Conference</i> . (Available from Instructor)
Week 7	Reading Week – No Readings ☺
Week 8	Hauer & Lamberti (2006) <i>Methods in Stream Ecology</i> . Elsevier Inc., Burlington MA, USA. (Chapter 3) Barbour et al (1999) <i>Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish</i> , Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C. (chapter 5)
Week 9	Hauer & Lamberti (2006) <i>Methods in Stream Ecology</i> . Elsevier Inc., Burlington MA, USA. (Chapter 28)
Week 10	Hauer & Lamberti (2006) <i>Methods in Stream Ecology</i> . Elsevier Inc., Burlington MA, USA. (Chapter 20 & 35)
Week 11	Hauer & Lamberti (2006) <i>Methods in Stream Ecology</i> . Elsevier Inc., Burlington MA, USA. (Chapter 16 & 17 & 34) Stanfield (2005) <i>Ontario Stream Assessment Protocol</i> . Ontario Ministry of Natural Resources (Section 3)
Week 12	No Readings
Week 13	No Readings

Statement on Academic Offences:

The statement: “Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/handbook/appeals/scholastic_discipline_grad.pdf

Statement on Health and Wellness:

As part of a successful graduate student experience at Western, we encourage students to make their health and wellness a priority. Western provides several on campus health-related services to help you achieve optimum health and engage in healthy living while pursuing your graduate degree. For example, to support physical activity, all students, as part of their registration, receive membership in Western’s Campus Recreation Centre. Numerous cultural events are offered throughout the year. Please

check out the Faculty of Music web page <http://www.music.uwo.ca/> , and our own McIntosh Gallery <http://www.mcintoshgallery.ca/> . Information regarding health- and wellness-related services available to students may be found at <http://www.health.uwo.ca/>

Students seeking help regarding mental health concerns are advised to speak to someone they feel comfortable confiding in, such as their faculty supervisor, their program director (graduate chair), or other relevant administrators in their unit. Campus mental health resources may be found at http://www.health.uwo.ca/mental_health/resources.html