

# Geography 405 Course Outline (2016)

(Tentative Version)

12 September 2016

Wetlands are a key landscape feature that integrate and modify ecosystem hydrology, geochemistry and ecology. They can fundamentally affect the quantity and quality of water in adjacent and downstream systems, local biodiversity and the global carbon cycle. The objective of this course is to provide students with a clear understanding of the ecohydrology of wetland systems by focusing on the abiotic and ecological processes, which together define and control wetland function. We will examine a range of wetland types, methods of classification, effects of disturbance, restoration and wetland management issues.

[Note: Field trip fee \$15 may be applicable]

This outline is available online at: LEARN

## Instructor:

[Jonathan Price](#)

ES1 122

Office Hours: TBA

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## Teaching Assistants

TBA

Office Hours: TBA

**Lectures:** 12:30-2:20 Monday and Wednesday DC1350/PAS1241

Materials presented in the lectures will be posted on LEARN before the lecture. You may choose to use these as a basis for your notes during class (strongly recommended). You are expected to attend all lectures. Materials presented in lectures will be part of the quizzes and term test.

## Course Requirements and Evaluation

Field Trip 1	5%
Field Trip 2	20%
Wetland Evaluation	35%
Online Quizzes	40% (best 4 out of 5)

## Field Trips:

There will be two field trips during which you will visit a variety of wetland types. One trip will be during class time to a nearby wetland. The other will be an all-day trip to wetlands in the Waterloo Region. These trips are intended to provide you with exposure and appreciation of their role in the natural environment and should help you to complete the wetland evaluation project. If you are unable to participate there is an alternative assignment you must complete in lieu of the field trip.

The first field trip will be **September 26 or 28** (you can choose which date) to the selected wetland in Waterloo. You are required to meet there at the designated time (via public bus service ([www.grt.ca](http://www.grt.ca)) or personal transport). There will be a short report (Lab 1), worth 5%. If you do not attend this field trip, your alternate assignment will be to write an essay (~1000 words + references and diagrams) on the hydrogeomorphic setting of a selected local wetland.

There will be an all-day field trip on **Saturday 23<sup>rd</sup> October**, leaving from the Ring Road in front of ES2 at 9:00 am or as otherwise designated. The cost will be (up to) \$15. You must provide your own food and refreshments. For this trip there is a report (Lab 2) required (20% of your final mark), in which you will complete selected portions of the Southern Ontario Wetland Evaluation System (SOWES). If you do not attend this field trip, your alternate assignment will be to write an essay (~2000 words+ references and diagrams) on the development of wetlands in the Waterloo region. Note: Those not attending this field trip will also have an alternate assignment for the term report since it is based on data collected during the field trip.

The term report (Wetland Evaluation) will be based on the two regional wetlands we visit on **23 October**. This report can be submitted individually, or in a group of two, and is worth 35% of your final mark. You will incorporate the data gathered on the field trip with literature and secondary data (e.g. government reports, maps, etc.) into a report comparing the development and ecohydrological function of the two wetlands we will visit. The objective of the exercise is to provide you with experience using the evaluation method and to make you think about the function that these specific wetlands have in the landscape. If you did not participate in the 17<sup>th</sup> October field trip, the alternate assignment is to provide a literature review (4000 words + diagrams and references) on the ecohydrological function of kettle-hole wetlands.

All material is due at the beginning of class on the specified due date. Late work will be subject to a late penalty of 10% off the total marks assigned for the exercise per day (including weekends). Assignments will not be accepted seven days after the due date. Special arrangements can be made when an assignment is late for university accepted, verifiable reasons beyond one's control. You must inform your professor immediately when such circumstances arise

There will be five quizzes each worth 10%; the best four out of five will count toward your final mark. They will be based on the materials of the preceding several lectures, especially the assigned readings and discussion papers. The tests will be done online through LEARN, posted on as shown on the itinerary table below. You have one attempt, and one week to complete the quiz.

**Itinerary: Dates for assignments and quizzes (tentative), and lectures (tentative)**

Tuesday	Thursday
<b>Sept 12</b> <i>Introduction: What is a wetland? Concept and Definitions</i> (Ch. 1, p.1-6) Wetlands of Canada (pdf 232 MB)	<b>Sept 14</b> <i>Hydrogeomorphic Setting of Wetlands</i> (Ch. 1, p.7-12; Ch. 10, 199-205) (Brinson, 1993 p. 19-25) <i>Wetland identification and classification</i> Canadian Wetland Classification System
<b>Sept 19</b> Discussion paper: Zoltai and Vitt (1995)	<b>Sept 21 Online Quiz</b> <i>Wetland Valuation; Southern Ontario Wetland Evaluation System (SOWES)</i> Local wetland field trip preparation
<b>Sept 26</b> Lab 1 Field Trip TBA (Group 1)	<b>Sept 28</b> Lab 1 Field Trip TBA (Group 2)
<b>Oct 3</b> <i>Wetland Development</i> (Ch. 7, p.127-143); Belyea and Baird (2006) p. 299-305	<b>Oct 5</b> <b>Field trip 1 (Lab 1) due</b> <i>Carbon Exchanges in Wetlands</i> (Ch. 12, p.254-273) (Ch. 14, 296-306)
<b>Oct 10 Thanksgiving</b>	<b>Oct 12 Fall Break</b>
<b>Oct 17 Online Quiz</b> Discussion paper: Roulet et al. 2007	<b>Oct 19</b> Field Trip Organization and Lab 2 presentation
<b>Saturday October 23 Field Trip</b>	
<b>Oct 24</b> <i>Wetland Hydrology</i> (Ch. 8); Rochefort et al. (2012), p. 119-121	<b>Oct 26</b> Discussion paper: Ingram (1982)
<b>Oct 31 Online Quiz</b> <i>Wetland Hydrology</i> (continued) Case Study	<b>Nov 2</b> Lab 2 Help Session
<b>Nov 7</b> <i>Wetland Biogeochemistry</i> (Ch. 9); Rochefort et al. (2012), p.121-123	<b>Nov 9</b> <b>Lab 2 Report due</b> Term Project Presentation
<b>Nov 14</b> <i>Wetland Biogeochemistry</i> (continued) Case Study)	<b>Nov 16</b> Term Project Q & A
<b>Nov 21 Online Quiz</b> <i>Wetland Ecology and Adaptation</i> (Ch. 3, p. 274-287)	<b>Nov 23</b> <i>Human Use of Wetlands</i> (Ch. 12, p.259-261; Ch. 13, p.262-279)
<b>Nov 28</b> <i>Wetland Restoration</i> (Ch. 12, p.287-294)	<b>Nov 30</b> Discussion paper: <a href="#">Elzinga, 2010</a> Term Project Q & A
<b>Dec 5 Online Quiz</b> <i>Wetland Construction (Reclamation)</i> <b>Term Project Assignment due</b>	

## Required Texts

Rydin, H., & Jeglum, J. K. (2013). *The Biology of Peatlands*, 2e. Oxford University Press. (This book is on reserve in Davis library).

## Also Useful

Mitch, W.J. and J.G. Gosselink, *Wetlands* (4th Ed.), New York: John Wiley and Sons, Inc. 2007. 600 pp. (previous edition on reserve in Davis Library)

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## Required Readings (available online or through LEARN):

Belyea LR, Clymo RS. 2001. Feedback control of the rate of peat formation. *Proceedings of the Royal Society of London: Biological Sciences* 268: 1315–1321.

Canadian Wetland Classification System <http://www.wetlandscanada.org/WetlandClassification1997.pdf>

Elzinga, M. (2010). The Peat Report: A Case For Canadian Peat Moss. *Greenhouse Grower*. <http://www.greenhousegrower.com/article/19187/the-peat-report-a-case-for-canadian-peat-moss>

Ingram, H. A. P. (1982). Size and shape in raised mire ecosystems: a geophysical model.

Rocheffort, L., Strack, M., Poulin, M., Price, J.S. and Lavoie, C. 2012. Northern Peatlands, *in* *Wetland Habitats of North America: Ecology and Conservation Concerns* (Batzer, D.R., and Baldwin, A.H., eds), University of California Press, Los Angeles, 119-134.

Roulet, N. T., Lafleur, P. M., Richard, P. J. H., Moore, T. R., Humphreys, E. R., and Bubier, J. 2007. Contemporary carbon balance and late holocene carbon accumulation in a northern peatland, *Glob. Change Biol.*, 13, 397–411.

## Southern Ontario Wetland Evaluation System (SOWES)

Zoltai, S.C. and D. Vitt. 1995. Canadian Wetlands - Environmental Gradients and Classification. *Vegetation*, 118: 131-137.

## Additional Reading and Reference Materials

Publications of the North American Wetlands Conservation Council (Canada) <http://www.wetlandscanada.org/pubs.html> (Many useful government reports and publications)

Wetlands of Canada. 1988. Canada Committee on Ecological Land Classification. 454p. <http://www.wetlandscanada.org/Wetlands%20of%20Canada.pdf> (221 MB)

## Academic Honesty

**Academic Integrity:** To create and promote a culture of academic integrity, the behavior of all members of UW is based on honesty, trust, fairness and responsibility. Students who are unsure what constitutes an academic offence are requested to visit the on-line Tutorial at <http://www.lib.uwaterloo.ca/ait/>

**Note for students with disabilities:** The Office for Persons with Disabilities (OPD), located in Needles Hall, Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the OPD at the beginning of each academic term.

**Religious Observances:** Please inform the instructor at the beginning of term if special accommodation needs to be made for religious observances that are not otherwise accounted for in the scheduling of classes and assignments.

**Grievance:** A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70—Student Petitions and Grievances, Section 4, <http://www.secretariat.uwaterloo.ca/Policies/policy70.htm>

**Discipline:** A student is expected to know what constitutes academic integrity, to avoid committing academic offenses, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about “rules” for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71—Student Discipline. For information on categories of offenses and types of penalties, student should refer to Policy 71—Student Discipline, <http://www.secretariat.uwaterloo.ca/Policies/policy71.htm>

**Appeals:** A student may appeal the finding an/or penalty in a decision made under Policy 70 or Policy 71 if a ground for an appeal can be established. Read Policy 72—Student Appeals, <http://www.secretariat.uwaterloo.ca/Policies/policy72.htm>