There will be no lab on Friday Sept 2.

**Instructor:** Prof. Gail Chmura, Room 628, Burnside Hall, 926-6854, gail.chmura@mcgill.ca office hours by appointment

**Lectures** Thursday 3:35-am 5:25 pm, room 308 Burnside Hall (BH)

**Labs** Monday 11:35 am – 2:25, pm One week will be outside, then BH 5th floor electronic classroom (511), except for 2 labs immediately following our field trip when we will be processing samples in BH 615. I hope to have lab instructions distributed in class prior to the scheduled lab activity.

**Required Field trip:**
We will take a three day field trip (Sept 23-25) to wetlands along the St. Lawrence River. Students will be responsible for costs of meals, cost of housing and partial cost of transportation. Transportation will be partially subsidized for Geography majors. You will need rubber boots (calf height) and rain gear that you are willing to get muddy.

**Prerequisites:** Permission of instructor. Students should have completed other courses in natural science at the 300 level. A course in ecology or plant science will be particularly helpful.

**Course outcomes**
This course covers many of the basics of biogeography using wetland ecosystems as examples.
1. Experience with field and mathematical techniques for describing plant communities.
2. Knowledge of ecological biogeography.
3. An appreciation of the biophysical structure of wetlands, the major ecological processes that occur in wetlands and the environmental factors that control the structure and function of wetland systems
4. A wetland vocabulary (understanding of terms for wetlands and their vegetation)
5. Ability to organize and present scientific data
6. Familiarity with statistical techniques useful for analyzing environmental data (similarity measures, regression, classification and ordination methods)
7. Knowledge of critical ecosystem functions and services of wetlands
8. Knowledge of anthropogenic impacts (climate change, nutrient enrichment, invasives) on wetlands

Calendar description of GEOG 470
An examination of the structure, function and utility of wetlands. Topics include the fluxes of energy and water, wetland biogeochemistry, plant ecology in freshwater and coastal wetlands and wetlands use, conservation and restoration. Field trip(s) are envisaged to illustrate issues covered in class.

Evaluation:
Rather than test your ability to recall information and compose thoughtful prose in a sleep-deprived state, you will be evaluated on your knowledge of the course material through a series of assignments. These assignments will require you to apply material from lectures and readings as you assess data from the field trip and labs, or the primary literature. (Lecture topics are followed by A# to indicate the relevant assignment.) By their nature, there can be no set rubric for grading the assignments. To obtain a “B” grade it should be clear from your writing that you have covered and understand the assigned material as well as the science it is based upon. If you make a statement that contradicts your readings you must recognize that apparent contradiction and explain your position. You also must follow instructions. For example, if you are asked to critique a model or hypothesis presented in a paper, you must be able to recognize these aspects and not simply consider a related detail. “A” grades will be awarded to those papers that demonstrate insight and creativity. To receive top grades you also must write clear, direct prose with good grammar. You will receive critiques of these aspects of your writing using Word’s track changes and expectations of good writing will increase over the semester.
The research you do for assignments is original and the whole class can benefit from what you have learned. Thus, each student will prepare a 3-minute oral presentation (limited to 3 PowerPoint slides) for Assignments 2 - 4 and 5 for Assignment 5 which will be a longer presentation. These will not be graded, but do provide a chance to get feedback on your assignment before it is submitted for grading.
<table>
<thead>
<tr>
<th>Assignment 1</th>
<th>Classification and values of wetlands visited on field trip</th>
<th>10%</th>
<th>Oct 7</th>
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</thead>
<tbody>
<tr>
<td>Assignment 2</td>
<td>Assess the nature of wetland succession as reflected in the paleoecological record reported in the primary literature</td>
<td>10%</td>
<td>Sept 29 Oct 3</td>
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<tr>
<td>Assignment 3</td>
<td>Critique Zedler’s invasive model with recent examples from the primary literature</td>
<td>5%</td>
<td>Oct 13 Oct 17</td>
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<tr>
<td>Assignment 4</td>
<td>Critique flood-pulse concept with recent examples from the primary literature</td>
<td>5%</td>
<td>Nov 3 Nov 7</td>
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<tr>
<td>Assignment 5</td>
<td>Update of textbook chapter on a type of wetland</td>
<td>20%</td>
<td>Nov 3 Nov 17 Nov 21</td>
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<tr>
<td>Assignment 6</td>
<td>Diversity of wetlands &amp; its controls (this is an original analysis and report of data collected in the field and laboratory - no oral presentation)</td>
<td>30%</td>
<td>Dec 7 Dec 16</td>
</tr>
<tr>
<td>Grad only Assignment 7</td>
<td>Meta-analysis or original review on topic to be chosen in consultation with Prof. Chmura</td>
<td>20%</td>
<td>Sept 18 Oct 16 Oct 23 Nov 10 Dec 14</td>
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Readings
Copies of the two texts will be on reserve at the Schulich Library and the fifth edition of Wetlands has been ordered at the McGill bookstore. (It also is available as an ebook for CDN $124.99.)

You will use this text for Assignment 5

Additional publications are assigned (see attached) for many topics. Some will be downloadable from mycourses, some distributed in class and others can be obtained through the McGill Library.

Tentative lecture topics and readings see announcements in class for updates
“Chapters” refers to Mitsch & Gosselink text, additional papers may be assigned

The quagmire of wetland plant forms, wetland types and classification (A1)
- Chapters 2 Wetland Definitions and 8 Wetland Classification

Ecological services of wetlands (including uses and management (A1)
- Chapter 1 Wetlands: Human History, Use and Science;
- Chapter 11 Values and Valuation of Wetlands

Special adaptations of organisms to wetland conditions (field trip, A2, 5, 6)
- Chapter 6 Biological Adaptations to the Wetland Environment

Wetland succession – myths, historical baggage and evidence from paleoecological studies (A2)
- Chapter 7 Wetland Ecosystem Development
- Excerpts from writings of Clements and Gleason – download from mycourses
- Written “dialog” with Hughes – download from mycourses
- Wetland terms and definitions – download from mycourses
What is a propagule? Climate warming and problems of upstream migration! (A3, 6)  
- See PowerPoint on mycourses.

Invasive species (A3)  

Pulse-flood concept (A4)  

Hydrology - why do wetlands exist? - Tides, floods, and Sphagnum (A5)  
- Chapter 4 Wetland Hydrology

What makes flooded soils special? Wetland soil chemistry and redox potential (A5, 6)  
- Chapter 5 Wetland biogeochemistry

What controls diversity of wetlands? Environment, stress and competition (A6)  

Global change, sea level rise, hurricanes and tidal wetland sustainability  
- Chapter 7 Wetland Ecosystem Development and Chapter 10 Climate Change and Wetlands
Please note the following

• *McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see www.mcgill.ca/students/srr/honest/ for more information). Much of the graded material in this course is prepared using data collected as a group. You may discuss the veracity of this data with class members, but all thoughts expressed in your written products must be your own or properly referenced – see journal articles for examples.*

• *In accord with McGill University’s Charter of Students’ Rights, students in this course have the right to submit in English or in French any written work that is to be graded.*

• *For information on university and department policies for student assessment, please go to http://www.mcgill.ca/geography/studentassessment*

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• *As the instructor of this course I endeavor to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me and the Office for Students with Disabilities, 514-398-6009.*

• *End-of-course evaluations are one of the ways that McGill works towards maintaining and improving the quality of courses and the student’s learning experience. You will be notified by e-mail when the evaluations are available on Mercury, the online course evaluation system. Please note that a minimum number of responses must be received for results to be available to students.*

• *McGill has policies on sustainability, paper use and other initiatives to promote a culture of sustainability at McGill.* (See the Office of Sustainability.)

• *In the event of extraordinary circumstances beyond the University’s control, the content and/or evaluation scheme in this course is subject to change.*

• *Additional policies governing academic issues which affect students can be found in the McGill Charter of Students’ Rights* (The Handbook on Student Rights and Responsibilities is available here).