

**WETLANDS ECOLOGY**  
(E440, Autumn 2010)

**Note: This course is open to BSES, MSES and Environmental Science PhD students. All others require permission/approval of the Instructor.**

**Lecture:** Mondays & Wednesdays 9:30-10:45 AM, SPEA room 275

**Lab:** Most Fridays, 8-12, SPEA loading dock

**Instructor:** Christopher Craft

**Office:** MSB II, Room 408

**Office hours:** Wed., 11-11:45 AM

**Description:** *Wetlands Ecology* emphasizes the ecosystem structure and function of freshwater and estuarine wetlands, the ecological services they provide and their value to society. The course focuses on seven basic areas:

(1) *Characteristics used to identify wetlands* (vegetation, soils, hydrology)

(2) *Classification of wetlands*

(3) *Plant and animal adaptations to anaerobic conditions*

(4) *Wetland community structure and ecosystem processes*

(5) *Biogeochemistry of wetlands*

(6) *Wetland functions and values*

(7) *Management of wetlands, including jurisdictional wetland delineation, hydrogeomorphic (HGM) assessment of wetland function and wetland creation & restoration.*

The information will be applied to discuss the role of wetlands as a component of ecosystems, landscapes and the biosphere, their importance as a sustainable resource (water resources and water quality, wildlife habitat and preservation of natural areas) and their economic and aesthetic values to society.

**Readings:** *Wetlands* by W.J. Mitsch and J.G. Gosselink (200) 4<sup>th</sup> edition. The textbook readings will be supplemented by a course-pak that can be purchased from Classpak Publishing and by reserve readings.

**Grading:**

You will be evaluated on your knowledge of the material based on 2 quizzes, term paper, group delineation project, created versus restored wetland write-up and HGM project. There will be 4 half-day field labs and 6 half-day field exercises. The purpose of the field labs is to learn how to identify wetlands from non-wetland areas and to characterize the different types of wetlands. The purpose of the group project is to learn how to delineate a jurisdictional wetland. The delineation exercise will culminate in a group report, including a field presentation that describes the results, including a map of wetland versus non-wetland acreage, of your jurisdictional wetland delineation. We also will visit a created and a restored wetland to discuss techniques, goals, trajectories of ecosystem development, "success" criteria, project cost and other factors. You will write a short paper comparing/contrasting the two wetlands with respect to these factors. In the HGM project, you will collect data to compare wetland function(s) of a natural and degraded forested wetland. The data will be collected as a group but the reports will be written and turned in individually.

**Students will complete a short (10-15 pages double spaced) term paper by November 19.** You should select a topic carefully, based on your own interests (research, policy, etc) as related to some aspect of Wetlands Ecology. Remember, I am interested in quality, not quantity. **The term paper should be an original piece of work and not something that was submitted for credit in another course.** The term paper must be a **literature review** that is formally organized with subheadings, including an Abstract, Introduction (with a statement of purpose), Results/ Discussion, Conclusions and a Literature Cited. The Literature Cited section should follow the style of the journal *Wetlands*. **Note: This is not a position/opinion paper.**

Term paper format: Double-spaced, 8-10 pages in length plus references.  
20+ references, at least 80% are from the peer-reviewed literature.  
Use a scientific journal (e.g. *Wetlands*) as a template for citing and listing references.

Term paper critique:      1. FOCUS on a specific topic.  
    2. Include some visual aides (e.g. tables and figures).  
    3. Cite mostly scientific (wetlands, ecological) literature.  
    4. PROOFREAD your paper.

Term paper deadlines:      Oct. 15 (Topic, 5%)  
    Nov. 5 (Rough draft, 10%)  
    Nov. 19 (Assignment due, 85%)

**Note: I DO NOT accept email submission of term papers, lab write-ups, etc.**

**Note: I DO NOT accept late assignments.**

<b>Grading Criteria:</b>	<b>Quiz #1</b>	<b>(Sept. 27)</b>	<b>20%</b>
	<b>Quiz #2</b>	<b>(Oct. 27)</b>	<b>20%</b>
	<b>Delineation exercise</b>	<b>(Oct. 29)</b>	<b>20%</b>
	<b>Term paper</b>	<b>(Nov. 19)</b>	<b>20%</b>
	<b>Created &amp; Restored Wetlands</b>	<b>(Nov. 29)</b>	<b>10%</b>
	<b>HGM exercise</b>	<b>(Dec. 10)</b>	<b>10%</b>

**Note:** “The devil is in the details.” In order to perform well on the tests, **you will need to master detailed information** from the lectures and lecture notes. If you are not able to develop a command of knowledge of details, this course is not for you.

**Note: I do not re-grade tests. If you want a question re-graded, you will need to put the request in writing.**

**Lecture Schedule:**

<b>Date</b>	<b>Topic</b>	<b>Reading assignment</b>
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August 30	Overview / Wetland Vegetation	Mitsch and Gosselink, chapters 1, 2, 3, 4 & 8
Sept. 2 *, 6	Wetland Soils	
Sept. 6, 8	Wetland Hydrology	M & G, chapter 5
Sept. 13	Classification of Wetlands	M & G, chapter 21
Sept. 15 *	Plant / Animal Adaptations	M & G, chapter 7
Sept. 20	Bottomland & Alluvial Forests	M & G, chapters 14 and 15;
Sept. 22	Review session	
<b>Sept. 27</b>	<b>Quiz 1</b>	
Sept. 29	Northern Peatlands	M & G, chapter 13
Oct. 4	Tidal Salt Marshes	M & G, chapter 9; Reading: Multiple Stable Isotopes Used...

Oct. 6	Jurisdictional Wetland Delineation	M & G, chapters 18 and 21
Oct. 11, 13	Wetland Biogeochemistry & Nutrient Cycling	M & G, chapter 6
Oct. 18	Wetland Ecosystem Processes (Productivity / Decomposition / C cycling)	Reading: Latitudinal Trends in Organic C Accumulation...
Oct. 20 *	Wetlands and Herpetofauna	
Oct. 25	Review session	
<b>Oct. 27</b>	<b>Quiz #2</b>	
Nov. 1	Wetland Functions and Values	M & G, chapter 16 Readings: Value of the World's Ecosystem Services. <i>Wetlands at Your Service...</i>
Nov. 3	Wetland Mitigation	M & G, chapter 19 Readings: Assessing Wetland Mitigation Sites... Landscape characteristics of a stream & wetland mitigation... Rapanos Guidance
Nov. 8, 10	Wetland Creation and Restoration	M & G, chapter 19; Readings: Pace of Ecosystem Development of Constructed... Forms and Accumulation of Soil P... Ecological Functions of an Impounded...
Nov. 15 *	Coastal Wetlands and the BP Oil Spill	
Nov. 17 *	Wetland Restoration and Enhancement (Rachel Powers, Ecologic)	Field excursion
<b>Nov. 22</b>	<b>Thanksgiving – no class</b>	
Nov. 29	HGM Assessment of Wetland Functions	
Dec. 1	Constructed & Natural Wetlands for Nutrient Removal & Wastewater Treatment	M & G, chapter 20
Dec. 6	Wetlands & Nutrient Enrichment	Readings: Ecological indicators of Wetland Nutrient Condition...
Dec. 8	Wetlands and Climate Change	Readings: Effects of Accelerated Sea Level Rise on Tidal Marsh Ecosystem Services

**Lab Schedule:**

<b>Date</b> -----	<b>Topic</b> -----
Sept. 3	Field lab
Sept. 10	Field lab
Sept. 17 *	Field lab
<b>Sept. 24</b>	<b>Field Practical</b>
Oct. 1	Open Date
Oct. 8	Intro to Wetland Delineation
Oct. 15	Delineation Exercise
Oct. 22 *	Delineation Exercise (continued) *
<b>Oct. 29</b>	<b>Delineation Report &amp; Field Presentation</b>
Nov. 5	Open date
Nov. 12	Open date
Nov. 19 *	Creating, Restoring and Enhancing Wetlands
Nov. 26	Thanksgiving
Dec. 3	HGM Assessment of Wetland Functions
<b>Dec. 10</b>	<b>HGM Assessment Due</b>