

WETLAND ECOLOGY (GNIES/LA 361) SPRING 2015

(Tuesdays and Thursdays 3:30 - 4:45 Rm 175 Science Hall)

DATE	TOPIC	READINGS
Jan 20	Course Introduction; History of Wetland Ecology; Wetland Definitions	M&G: Ch.1&2; V: Ch. 1
22	Climatic Considerations; Pre-settlement Wetlands of North American <i>(Begin exploring potential wetlands to adopt)</i>	M&G: Ch.3; V: Ch. 2
27	Geomorphology Factors (Where do we find wetlands in the landscape?)	
29	Wetland Hydrology The water cycle; Introduction to Wisconsin wetlands <i>(Visit and gather background data on potential Adopted Wetlands)</i>	M&G: Ch. 4
Feb 03	Water in time & space (Hydrodynamics / Hydroperiods); “Isolated”, “Inland”, “Coastal” and “Tidal” wetlands	
05	Water budgets / energy budgets; Hydrologic - biotic interactions <i>(Choose and visit your Adopted Wetland)</i>	
10	Wetland Soils – definitions, characteristics and formation processes <i>(Choose your Debate Group)</i>	M&G: Ch. 8
12	Biogeochemistry of Wetlands Microorganisms and Biogeochemistry cycles, the key role of O ₂ and H ⁺	M&G: Ch. 5
17	Carbon, nutrient and mineral cycling in wetlands	
19	Biological adaptations to the wetland environment Plant Adaptations	M&G: Ch. 6
24	Animal Adaptations; Intro to WI waterfowl & amphibians	
26	Wetlands in Time – Succession; Case Studies of Wetland Changes Autogenic, allogenic and anthropogenic processes Changes in American wetlands over two centuries – <i>class discussion</i>	M&G: Ch. 7 Vileisis Ch.3-8
Mar 03	Frog and Duck Quiz; Review Session for Midterm Exam	
05	(First “Midterm” Exam)	
10	Take Home Exam I due via email attachment: (TakeHome1_YOURLASTNAME)	
12	Field Trip to Lower Mud Lake (bus provided, return about 6pm)	

Mar	17	Are humans currently the main factor in Wetland Succession? <i>(Leopold Paper due via email attachment: (Leopold_YOURLASTNAME))</i>	Debate Group 1
	19	Wetland Management Wetland Regulation – past, present and future	Debate Group 2 M&G: Ch. 14
Mar	24	Wetland Restoration - the science	M&G: Ch. 12
	26	Wetland Restoration – the practice	
Apr	07	Wetland Restoration and Creation– miraculous turnabout or mirage?	Debate Group 3
	09	Selected Wetlands of North America vs. Climate Change Southern Wetlands	M&G: Ch. 10
	14	Boreal (Northern)Wetlands	
	16	Trouble in the tropics? Cruising the Northwest Passage?	Debate Groups 4 & 5
	18	(Saturday 8 am - 6 pm) <i>(Field Trip to Walworth County, bus provided)</i>	
	21	Can oil and gas extraction co-exist with wetlands? (7 th topic?) Review	Debate Group 6 (& 7?)
	23	(Second “Midterm” Exam, part in-class, part take-home)	Finish Vileisis before exam
	28	<i>(Pheasant Branch Field Trip - noon or 4 pm)</i>	
	30	<i>(Nine Springs Field Trip - noon or 4 pm)</i> Second Take-Home Exam due via email (TakeHome2_YOURLASTNAME)	
May	05	<i>(Cherokee Marsh Field Trip - noon or 4 pm)</i>	
	07	Final Classroom session - Arrange for Field Exam during finals week	

Texts: Mitsch. W. and E. Gosselink. 2007. Wetlands, 4th ed. Wiley.

Vileisis, Ann. 1997. Discovering the Unknown Landscape: A History of America’s Wetlands. Island Press.

Essay Leopold, Aldo. [Late 1930's]. Marshland Elegy with interpretive essay by Curt Meine
Wisconsin Academy of Sciences, Arts and Letters, Madison. 1999.

Fieldguide: Eggers, S.D. and D.M. Reed. 1997. Wetland Plants and Plant Communities of Minnesota and Wisconsin. 2nd ed.
U.S. Army Corps of Engineers, St. Paul. [Free to download from COE website]

Additional Material at: <https://uwmadison.box.com/s/1pwyt65yf09qnn00adaw>

Instructor:	Dr. Quentin Carpenter	Office Hours
	115F Science Hall; 263-7771 (office)	Tuesday 1 - 3
	(920) 723-7067 (cell) before 9 pm please	Thursday 1 - 3
	qcarpent@wisc.edu	or by appointment

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A. Expectations of Students

- 1) Students should have some background in basic ecology such as IES 126, Bot. 260, 460 etc. If this is a problem, consider getting this background first or see me about it early in the semester to arrange some additional background reading.
- 2) This is a “field course”. Fifty per cent of the grade comes from field work. Students must attend field trips and do field projects. If this will be a problem due to disability, work or class conflicts, or any other reason, consult with me the first week of the class.

B. Writing Assignments

- 1) Leopold Essay (8 %) (due 17 March)
After reading the “Marshland Elegy” essay by Aldo Leopold, the accompanying analysis by Curt Meine and Ann Vileisis’s book, you are to read one additional essay or book by an author of environmental or nature writing who may or may not have been influenced by Leopold and/or this essay. Write a two page (double-spaced, 12 pt.) essay of your own which connects this author and Leopold. I will also expect that you will place both authors within the broader wetland history context you learned while reading Ann Vileisis’s book. You may submit this anytime before the deadline but please do so as an attachment with filename: Leopold_YOURLASTNAME.
- 2) Field Project (30%) (due Monday, May 18, in lieu of a comprehensive final exam)
Students will "adopt" a wetland and visit it at least weekly to collect quantitative and/or qualitative data and to record natural history observations. Although simple measurements of wetland environmental factors (e.g., temp., water levels) are encouraged, the emphasis should be on phenology and natural history with a broad perspective (e.g., don’t forget past and present human uses). Wetlands in the spring are very active places. Use a field notebook/journal to record your weekly field observations and musings, but the final report should be more formal, with a detailed description of the setting, a well-organized chronology of the changes you observed and various analyses/interpretations of your data and observations. I will be looking to see if you can apply what you have learned in this course to a tangible wetland. Be sure to place your wetland within its landscape setting and discuss any conservation issues affecting it. The exact format and length are up to you. Examples of past papers are available during office hours.

- C. **Oral Assignment** (8 %) Working in paired groups of about three, students will research and present arguments on opposing sides of various issues concerning wetlands (*see page 2*). The paired groups should meet before the debate to find points of agreement (if any) and plan the format. I will serve as a resource; but, in many cases, there are others on campus (and beyond) who are actively engaged with these topics and who may be able to assist. These debates generally run about one-half hour including rebuttals and questions.

D. Exams

First Midterm exam	5 March	(20%)
Second Midterm exam	23 April	(14 %)
First “Field” Exam	3 March	(08%)
Second Field Exam	Arrange in May	(12%)

Note: The midterm exams are short essay with open-books and open-notes, but time is limited, so don’t expect

to look up much; portions may be “take-home.” On the field exams, you must work strictly from your memory.

Debate Topics

- 1) **Pro** – Studying natural succession processes is now a waste of time because most wetland changes are driven by humans altering the landscape, hydrology and/or geochemistry of wetlands.

Con – Studying natural succession processes makes good sense because humans are just another disturbance, and wetlands still obey the principles of ecological succession.

- 2) **Pro** – All wetlands should have federal protection because they are “waters of the U. S.”; and, all wetlands should enjoy state protection because they are “waters of the state.”

Con – The Constitution of the U. S. is generally tolerant of laws protecting “waters of the U.S.”; however, such protection does not extend to all wetlands, and state laws protecting such wetlands as “waters of the state” may conflict with the “takings” clause of the Constitution.

- 3) **Pro** – Intensive restoration efforts in recent years have now reversed a two-century trend of wetland loss.

Con – While the gross number of acres of “wetlands” may have stabilized, the degradation of wetlands continues unabated; indeed, it has likely accelerated in most areas of the country.

- 4) **Pro** – Semi-tropical wetlands in the U.S will adapt to the effects of Global Climate Change even if humans living near them do not.

Con – Global climate change will be a disaster for semi-tropical wetlands in the U.S. as well as humans in the vicinity.

- 5) **Pro** – Global climate change may benefit boreal and arctic wetlands in North America although humans across the globe may suffer adverse consequences from their increase.

Con – Global climate change will be a general disaster for all northern wetlands in North America.

- 6) **Pro** – With proper regulation, petroleum drilling can be done with minimal ecological damage, and the recent Gulf Spill shows that wetlands were tough and recovered easily and quickly after the spill.

Con – The most recent oil spill disasters simply reinforce the long-held consensus of knowledgeable ecologists that petroleum extraction nearly always damages wetlands, sometimes permanently.

- 7) If needed – Suggestions?