

Biol. 376 - Environmental Management

Spring 2015

INSTRUCTOR:

Dr. Ray W. Spear

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ISC 256

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Office hours:

M 10:30-11:20 & 2:30-3:20, W 3:45-5:00, F 12:30- 1:20

Other times by appointment.

CLASS MEETINGS:

C51627 01 3.0 M W F 1:30-2:20 pm ISC 136

TEXTBOOK:

Weathers, K.C., D. L. Strayer, and G. E. Likens 2013. Fundamentals of Ecosystem Science. Boston, MA 312 pages.

Papers in Course Materials on MyCourses

COURSE DESCRIPTION:

Environmental management is a loosely defined field, which can be studied from a number of different viewpoints. Our approach will emphasize ecological principles especially the properties of ecosystems. We will pay special attention to issues that impact New York State's terrestrial and aquatic environments.

The class topics can be roughly divided into three categories. The first category involves an in-depth study of ecosystem ecology which focuses on energy flow and the hydrologic, nutrient and element (including heavy metal) cycles in terrestrial ecosystems. We will use the northern forests of Eastern North America to illustrate the properties of terrestrial ecosystems. Our focus shifts to topics related to global change in category two. In particular we will examine climate change and current global environmental problems (problems which transcend political and geographic boundaries). Articles and readings from the environmental sciences will serve as a basis of discussion during this portion of the course. We will also debate environmental issues and the government's current environmental policies. The third and final category of topics include case studies which allow us to apply our knowledge of ecosystem properties and global change to regional and local environmental issues. As time permits we will also discuss current management theories, especially environmental risk assessment and ecosystem management.

LEARNNING OUTCOMES:

1. Students will be able to describe the relationship between ecosystem and environmental management.
2. Students will understand the role the environmental history of the United States plays in our management practices.
3. Students will be able to describe the structure and function of the White Pine Hemlock Northern Hardwood forest ecosystem of eastern North America.
4. Students will recognize the major factors perturbing the forest ecosystems of the Northeast.
5. Students will be able to make generalizations about the impact of global change on particular ecosystems and identify critical questions to ask about management practices.
6. Students will complete a case study of an environmental issue and best management practices.

COURSE MECHANICS:

CLASS MEETINGS

The class activities will be divided among more traditional lectures and discussions, active learning activities (debates), and group "presentations". The goal of the lectures, and myCourses readings is to provide you with the background information needed to address environmental management issues. Some analyses of these issues (discussions and the case study project) will be done in-groups to maximize the quality of work. The instructor will help students form groups during the first week of classes (by 1/26) and explain how they should work. Besides achieving higher quality analyses and greater productivity, group work is designed to build teamwork (collaborative skills).

EVALUATION

Your grade will be primarily determined by individual work. Two in-class exams and one take-home exam account for two thirds of your grade. The remaining third of the grade will be based on your groups' performance in developing a case study and in leading and participating in discussions and debates. Your group will also complete a assignment on a forest tree.

<i>Exams:</i>		66 pts
Exam #1	M 3/2	22 pts
Exam #2	M 4/6	22 pts
Exam #3 (take-home final)	M 5/4 (due date)	22 pts

Group Assignments:

34 pts

Participation in Class Discussions	1 pts
Tree Identification/Ecology	1 pts (due M 2/2)
Reading/Discussion	4 pts

The reading/discussions will be done in groups of 3 to 4 students. Each group will be responsible finding an article on an environmental issue related to a syllabus topic (the human impact on the particular ecosystem property). The article should be agreed upon by the group and instructor a minimum of one week prior to the class date for that topic. The group members will meet with the instructor before their class period to go over any problems they had with the article and to develop an informational handout with “discussion” questions for the class. The students will provide a brief (no more than 10 minute) summary of the assigned during the appropriate class period.

Case Study of a Local Environment Issue (Done in your groups of 3 to 4 students)	22 pts
	<u>date due</u>
1 page description of topic	F 2/13
annotated bibliography	F 3/13
class discussion & participation	F 4/8 to F 4/29
final report	F 5/4

Your case study on a local/regional environmental issue should focus on ecosystem management and include a consideration of the ecosystem properties and government policies involved. To do this you will probably need to use two different sources of information, primary and secondary. Primary sources could include things such as government reports or specific materials published by the participants in the issue. Personal communications (letters, e-mails and conversations) can also be an excellent primary sources of information. Secondary sources are equally or even more important. These are sources where data from primary sources or even other secondary sources are combined and summarized. At a minimum 5 of your references should be secondary sources from peer reviewed journals or books. Additional references can come from Web sites; however, you will need to include an annotation as to bias of the source and the quality of the information provided. At a minimum you should have 10 citations for your project report. Additional parameters for

the style and length of the oral presentation/discussion and written report will be given to you during the sixth week of class.

Debate

5 pts

(Done in your groups during the final exam period.
You will debate a current environment issue focusing on the application of ecosystem science. Instructions will be provided by Friday May 1st.

TENTATIVE CLASS SCHEDULE – SPRING 2015
BIOL 376 - ENVIRONMENTAL MANAGEMENT

Week	Date	Day	Topic	Reading/Quiz
1	1/21	W	Ecosystem management	Ch. 1 Text
	1/23	F	Environmental history	
2	1/26	M	Environmental history	Z. A. Smith 2013
	1/28	W	Environmental history	
	1/30	F	Ecosystem Properties	
3	22	M	Eastern Deciduous Forests Structure	B. Shuman 2004
	2/4	W	Forest history - NE	
	2/6	F	Current second growth forests	
4	2/9	M	Energetics Producers	Skim Ch. 2-4 Text
	2/11	W	Energetics Consumers/decomposers	
	2/13	F	Case Study HBEF	
5	2/16	M	Hydrologic Cycle	3. Schlesinger 2013
	2/18	W	Hydrologic Cycle HBEF	
	2/20	F	Hydrologic Cycle Case Study	
6	2/23	M	Biogeochemistry	Ch. 5 text
	2/25	W	Biogeochemistry HBEF	
	2/27	F	Biogeochemistry	
7	3/2	M	Exam #1	Ch. 6 text Schlesinger 2013
	3/4	W	Carbon cycle	
	3/6	F	Carbon cycle	
8	3/9	M	Carbon cycle HBEF	Groups # 5 & 6
	3/11	W	Carbon cycle Case Studies	
	3/13	F	Nitrogen cycle	
Springbreak 3/16-3/20				
9	3/23	M	Nitrogen cycle	Ch. 7 text Vitousek & Field 2003
	3/25	W	Nitrogen cycle	
	3/27	F	Nitrogen cycle	
10	3/30	M	Example Case Study	
	4/1	W	Heavy Metals	
	4/3	F	Heavy Metals	

11	4/6	M	Exam #2	
	4/8	W	Case Study	Group _____
	4/10	F	Case Study	Group _____
12	4/13	M	Case Study	Group _____
	4/15	W	Case Study	Group _____
	4/17	F	Case Study	Group _____
13	4/20	M	Case Study	Group _____
	4/22	W	Case Study	Group _____
	4/24	F	Case Study	Group _____
14	4/27	M	Case Study	Group _____
	4/29	W	Case Study	Group _____
	5/1	F	Controls on Ecosystems	Skim Ch 9-11 &17
15	5/4	M	Disturbance & Ecosystem Change	
			Position Paper for case study & Exam #3 (take-home) – due	

Final Exam (Debate) – 5/12 Tuesday 12:00-3:00 p.m. – ISC136

*Reading/Discussion assignments to be completed in groups of 3 to 4 students on bolded topics. Case studies are also done in groups of 3 or 4

