

Environmental Services
Honors course
Spring 2019
Tuesday & Thursday 2:00 – 3:15 PM

I. Instructor

Dr. Wayde Morse
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II. Pre-requisite/co-requisite

None

III. Course Format/credit hours

The course will consist of two, 1 ½ -hour lectures per week (for 3 total semester credits).

IV. Texts: These books and chapters are available on-line and can be downloaded for free.

1. Millennium Ecosystem Assessment. (2003). *Framework for assessment*.
2. Ecosystem Assessment. (2005). *Ecosystems and Human Well-Being: Current State and Trends, Volume 1*.
3. Landell-Mills (2002) *Silver Bullet or Fools Gold?* Additional required readings are cited in the course schedule and a reference list of additional readings is provided in a separate bibliography. All readings will also be available on Canvas.

V. Course Description

The environment provides a multitude of services critical to our survival and well-being. Ecosystems provide our food, fuel, regulate our climate, purify our water, and provide recreation opportunities and aesthetic enjoyment. We continue to diminish the ability of ecosystems to provide these services as our need for them grows. This class provides students an opportunity to thoroughly examine the environmental services that ecosystems provide, their connection to human well-being and livelihoods, and the political and market mechanism that have been designed to provide for their conservation. Specific focus will be on; biodiversity services, watershed services, carbon sequestration services, and cultural services.

VI. Course Objectives

1. To introduce students to the ecology of ecosystem services including; biodiversity services, watershed services, and carbon sequestration services
2. To provide students a thorough understanding of cultural services
3. To introduce the student to the issues regarding the provision and valuation of environmental services
4. To understand the foundations and methodologies for valuing environmental services
5. To understand the justification for markets for environmental services and critical aspects of the programs
6. To enable students to effectively communicate about environmental services and critically evaluate markets for environmental services.

VII. Course content (See course schedule below)

VIII. Justification for Honors Credit

Examination of the topic schedule should illustrate that the course will draw together a very wide breadth of knowledge from many areas including economics, ecology and social sciences. The course will require synthesis of this information in the context of market conservation efforts designed to enhance environmental services. The implications of these programs on human well-being and landowner livelihoods within both developing and developed countries will require analysis and synthesis of information for decision-making across a spectrum of realistic, and complex, scenarios.

IX. Course Requirements/Evaluation

Students will be evaluated via in-class participation, assignments, exams, and a final project. In-class participation will be evaluated base on attendance and informed contribution to class discussions.

Assignments:

- **Exams:** 3 exams will be give during the semester. Each will heavily weight their specific third of the class (2-component sections each) but will be cumulative.
- **Case presentations:** For each section of the course, select students will be required to identify a case study on the current topic. Students present on only 1 topic. Each presentation will last 12-15 min with time for questions. Students will present these as if it were their own research and presented at an academic conference. Guidelines on how to develop an academic conference presentation will be provided.
- **TED style lectures:** Students will watch TED lectures on Ecosystem Services and reflect on content and style of presentation to learn the dos and don'ts of expert presentations.
- **Final concept map:** Students will independently develop a concept map synthesizing the course content and connections among course topics. Conceptual mapping is a technique used to visually represent multiple variables and their relationships. Each student determines their own focus area within the class and builds their model from that perspective. For example, a student may choose to focus on local livelihood impacts of a watershed services payment program and then build out the rest of their conceptual map from that perspective identifying the most important connections out to include all of the relevant topics from the course. Each student will provide an 8-minute presentation of their concept map with 2 minutes of questions during the last week of classes. A four page synthesis explaining the concept map outlining nodes, connections, flows and relationships. A full handout with instructions will be provided.

<u>Item</u>	<u>% of grade</u>
Participation in Class	10%
Exam 1	15%
Case presentations	15%
TED lecture Analysis	5%
Exam 2	15%
Final Concept map	25%
Exam 3	15%

The standard grading scale will be used (i.e., 90-100% = A; 80-89% = B; 70-79% = C; 60-69% = D; <60% = F).

Environmental Services: Course Schedule

Date	Lecture Topics	Have read by day listed *optional reading	Assignment
1/10 TR	Syllabus review/course description	Introduction to class	
1/15 T	What are environmental Services?	MEA (2003) Ch2	
1/17 TR	Ecosystem services and human wellbeing/ livelihoods	MEA (2003) Ch 3 *Costanza (2007)	
1/22 T	Drivers of land use change & Social Ecological Systems	Morse (2013) *Geist and Lambin 2001	
1/24 TR	Markets: Market failure and creation	Landell-Mills (2002) Ch 2 *Engle 2008	
1/29T	Payments for Ecosystem Services	Engle 2008	
1/31 TR	Valuation: Concepts & Techniques	MEA (2005) Ch 2 (pg. 53-67) *NRC (2005) Ch 2 (33-58)	
2/5 T	Targeting, GIS and spatial analysis	Wünscher 2008	
2/7 TR	Exam 1		
2/12 T	Watershed services: Freshwater services ecology	Calder (2004) *Lele, S. (2009)	Guest lecture: Watershed specialist
2/14 TR	Watershed markets: Livelihood impacts & human well-being	Landell-Mills (2002) Ch 5 *Porras (2010)	
2/19 T	Case examples of watershed PES	<i>Student presentations</i>	3+ presentations
2/21 TR	Carbon: What it is and ecological measurements	Landell-Mills (2002) Ch 4	Guest lecture: Carbon specialist
2/26 T	Carbon markets: Livelihood impacts & human well being	Smith and Scherr (2002) *Dwivedi (2012)	
2/28 TR	US National programs of PES	Farm Bill excerpts/CRP	
3/5 T	Case examples of carbon PES	<i>Student presentations</i>	3+ presentations
3/7 TR	Exam 2		
3/11- 3/15	Spring Break		
3/19 T	Cultural and amenity services: What they are and social-economic measurements	*Chan (2012) Daniel 2012 Cultural Services	
3/21 TR	Data collection methods for cultural services	(In class concept mapping exercise review)	
3/26 T	Recreation/amenity services: Case examples	<i>Student presentations</i>	3+ presentations
3/28 TR	TED style lectures: Dos and Don'ts	Videos	Concept mapping instructions
4/2 T	Biodiversity (BD): What it is and ecological measurements	TBA	Guest lecture: Biodiversity specialist
4/4 TR	Disease Ecology and One-Health: Ecosystems services/disease control	TBA	Guest lecture: Disease ecologist specialist
4/9 T	Biodiversity: Markets & livelihood impacts & human well being	Landell-Mills (2002) Ch3 *Richardson (2009)	
4/11 TR	Biodiversity: Case examples of PES	<i>Student presentations</i>	3+ presentations
4/16 T	Agricultural and Urban Ecosystem Services	TBA	
4/18 TR	Case examples of Urban or Agricultural services	<i>Student presentations or lecture on cases</i>	3+ presentations
4/23 T	Concept map presentations		
4/25 TR	Concept map presentations		
4/29-5/3	Final Exam 3		