

**Ecosystem Services
FW 462/562**

Credits: 3

Term(s) Offered: Spring (on-line)

Instructor: S.J. DeBano

Course Content: This course introduces students to the ecological, economic, and social/ethical issues involved in the study of ecosystem services, with a major focus on biological components involved in ecosystem services. Topics covered include: 1) an introduction to the roles that living organisms play in the provision of ecosystem services, 2) the relationship of ecosystem functions and services, 3) the societal factors that influence this relationship, 3) general categories of ecosystem services, 4) identification of potential ecosystem services in terrestrial and aquatic systems, 5) an overview of methods of valuation, and 6) translating ecosystems functions to services. Case studies will be used to illustrate key concepts and relationships within different ecological and social contexts.

Prerequisites: BI 370 (General Ecology)

Text and Other Learning Resources: Two texts are required for the course (both have free online versions):

Millennium Ecosystem Assessment, 2005. Ecosystems and Human Well-being: Synthesis. Island Press, Washington, DC.

National Research Council, 2005. Valuing Ecosystem Services: Toward Better Environmental Decision-Making. The National Academies Press, Washington, DC.

Students will also be assigned one or two additional readings each week, including papers from scientific and professional journals.

Measureable Student Learning Outcomes:

As a result of completing this course, students will be able to:

- describe the diversity of living organisms involved in the provision of ecosystem services;
- explain the complexity of the relationship between the physical and biological environment of organisms and their ecological function;
- identify the challenges of measuring ecological functions associated with biological populations and communities in real world systems;
- describe the relationship between ecosystem functions and services, and illustrate the dependence of this relationship on its political, social, and economic context;
- explain the different categories of services provided by ecosystems;

- summarize common methods of valuation and evaluate the advantages and limitations of various approaches;
- assess the social and ethical issues that contribute to controversy in valuing ecosystem services;
- identify the underlying assumptions and validity of interdisciplinary approaches that incorporate the value of ecosystem services into natural resource management; and
- produce examples that illustrate the dynamic nature of the provision and valuation of ecosystem services and the impact of ecological, social, and political factors.

Expectations for Undergraduate and Graduate Students with Regard to Learning Outcomes:

Different expectations for learning outcomes for undergraduate and graduate students are reflected in assignments and their assessment. Undergraduate students will read one article a week in addition to the reading assignment from the regular texts, while graduate students will read two articles a week (one that is assigned to undergraduates and one more challenging paper). Homework and journal club contributions for graduate students should not only reflect knowledge gained from their additional readings, but also should clearly show an ability to synthesize the readings and lecture materials. Quizzes for graduate students will not only cover additional readings, but will demand a more sophisticated understanding of the content. For the final project, undergraduate students will synthesize their learning in a final paper on a topic that they choose from a list provided by the instructor. Graduate students will prepare a grant proposal incorporating an ecosystem services component in their area of interest.

Evaluation of Student Performance:

Activity	Point Value	Description
Quizzes	200	Covers readings and lectures – 4 at 50 pts each
Discussion Board	150	Weekly contribution of one original comment and two replies (5 pts for each, for 15 pts a week)
Journal Club	100	Graduate students will participate in an on-line journal club over additional assigned readings
Homework Assignments	200	Undergraduate – 2 at 100 pts each Graduate students – 4 at 50 pts each
Final Project	100/200	Undergraduate students: synthesis paper – 100 pts Graduate students: grant proposal – 200 pts

Students for whom the course is intended: Undergraduate or graduate students in Fisheries and Wildlife, Forestry, Biological Sciences, or any natural resources related field.