

**Adaptive Management of Natural Resource Systems
FW 854 3 (2-2)
Fall of odd numbered years**

INSTRUCTOR

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PREREQUISITES

ZOL 355 and FW 434

COURSE DESCRIPTION

Principles and practices of adaptive environmental assessment and management. How uncertainty affects natural resource management.

TEXT

None. Key references are:

- Holling, C. S. 1978. Adaptive environmental assessment and management. Chichester, UK: Wiley. [*the original book on adaptive management*].
- Walters, C. 1986. Adaptive management of renewable resources. New York, NY: MacMillan. [*a more technical discussion of adaptive management than Holling (1978); describes relationship of AM to decision analysis.*].
- Morgan, G, and M. Henrion. 1990. Uncertainty: A Guide to Dealing with Uncertainty in Quantitative Risk and Policy Analysis. Cambridge, UK: Cambridge University Press. [*broad overview of how uncertainty should affect decision making and policy design - excellent introduction*].
- Lee, K. N. 1993. Compass and Gyroscope: integrating science and politics for the environment. Washington: Island Press. [*A thoughtful text on adaptive management and related issues from a social scientist's perspective*].
- Clemen, R. T. 1996. Making Hard Decisions: An Introduction to Decision Analysis. Belmont, CA: Duxbury Press.

A more extensive reading list will be distributed during the semester. There is no course pack or books on reserve at the library. Readings will be distributed as they are assigned.

COURSE OBJECTIVES

1. Convince students of the importance of uncertainty to natural resource management;
2. Learn how uncertainty should affect decision making, through decision analysis and related methods; and
3. Learn how decision making can affect uncertainty, through adaptive management;
4. Explore the thesis that recognizing uncertainty can help resolve conflicts which hinder effective natural resource management
5. Expose students to the use of computer modeling tools to incorporate uncertainty into decision-making.

COURSE OVERVIEW

This course will introduce students to the principles and practice of adaptive management and the broader issue of how resource management should explicitly recognize the significance of uncertainty. The course will have three components: (1) Readings, lectures and discussions on topics related to technical and philosophical aspects of adaptive management and decision making in an uncertain world; (2) computer lab-based instruction on techniques of model building, stochastic simulation, and decision analysis; and (3) an intensive case study in which the ideas presented in (1) and (2) are put into practice in a group project. The case study will utilize the techniques of Adaptive Environmental Assessment and Management (AEAM). All course participants will be actively involved in the model conceptualization and construction process. Some students (3-5) will be selected to facilitate this process, ideally based on previous experience with modeling. The remaining students will adopt (and research) roles as experts or stakeholders, and then assume those roles in the model conceptualization process. Through this interactive process students will learn how AEAM works, develop an appreciation for the role uncertainty plays in resource management, and see how stakeholder interactions can be facilitated by focussing attention on our collective understanding of a natural resource system, rather than on the (apparently) divergent objectives of different interest groups.

EVALUATION

The success of this course will depend considerably on effective (active, constructive, substantive) participation by all students. I will weigh class participation heavily in my overall evaluation. I will collect small homework assignments throughout the first two stages of the course to encourage students to familiarize themselves with the concepts and technical aspects of the material we cover. As we read the literature on adaptive management and decision analysis in the first portion of the course, we will hold structured debates on the topics covered in the literature in which each student will be expected to actively participate. Each student will also choose a problem to analyze for potential application of adaptive management, deliver a short oral presentation on their analysis and then write up a short summary report. There will be no final exam.

The following are general guidelines for the weight assigned to each aspect of evaluation:

General class participation	20%
Reading/mini-writing assignments	20%
Analytical essay/interview	30%
Computer assignments	25%
Case study contribution	30%

Note that they add up to 125%. I will tailor my evaluation of each student to favor their individual strengths and areas of interest. However a passing grade (3.0) will require adequate performance in all categories.