

University of Hawai'i Mānoa
Department of Natural Resources and Environmental Management (NREM)

DEGRADATION OF HUMAN-DOMINATED ECOSYSTEMS – NREM 612

Course Description: It has been estimated that one-third to one-half of the earth's land surface has been transformed by human activities, and it can be argued that no ecosystem on earth is free of human influence. This course will consider the historical context of degradation, the current status, and the different types of degradation (physical, chemical, biological). The majority of the course will focus on degradation issues associated with different types of human-dominated ecosystems including forest, rangeland, agriculture, urban, wetland, coastal, and island. The later part of the course will investigate appropriate conservation and restoration approaches to mitigate the effects of degradation.

Instructor: Dr. Susan Crow

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Class Meetings: Ag. Sci. 220, Tues. and Thurs. 1:30 – 2:45 PM

Office Hours: Tues. 4-5 PM

Prerequisites: NREM 304, NREM 461, and NREM 600 recommended.

Textbook/Readings: There is no required textbook for the course. Readings will be handed out in class, or will be available online (Laulima and/or website above) and in Sherman 201 above the microwave for you to read or copy. A number of the readings will be from the following text: Barrow, C.J. 1991. *Land Degradation*. Cambridge University Press, Cambridge. Other texts that provide background information are: (1) Troeh, F.R., Hobbs, J.A., and Donahue, R.L. 2004. *Soil & Water Conservation for Productivity & Environmental Protection*, 4th Ed. Prentice Hall, Upper Saddle River, NJ; & (2) Morgan, R.P.C. 2005. *Soil Erosion & Conservation*, 3rd Ed. Blackwell Publishing, Malden, MA.

Student Learning Objectives (SLOs)

Upon completion of this course you should:

- Understand the historical context and current status of degradation that occurs in human-dominated ecosystems
- Be able to discuss verbally or in writing concepts of stability, resistance, and resilience
- Be familiar with the causes and effects of physical, chemical, and biological degradation
- Gain a better understanding of the current status, degradation issues, and management options for the following ecosystems: forest, rangeland, cropland, urban, wetland, coastal, and island.
- Know how to calculate diversity indices and use USLE, WEQ, and island biogeography models
- Be capable of suggesting appropriate conservation or restoration measures to mitigate degradation in various human-dominated ecosystems
- Be able to evaluate the scientific merit of papers in the field of ecosystem degradation
- Demonstrate more effective participation in and facilitation of group discussions

Expectations of Students: I expect that you will do the assigned readings prior to the lectures. I expect that you will arrive to class activities on time, with the proper equipment, and that you will be respectful of your fellow students and me during all class activities. I expect you to be an active participant in class activities by taking notes, asking questions, and working with the other students in the course.

Expectations of the Instructor: My goal as an instructor is to make this course as enjoyable and useful to you as possible through a variety of methods such as lectures, readings, assignments, discussions, exams, and projects. I will accomplish this by being punctual and prepared for course activities and enthusiastic about my duties as an instructor. I will communicate clearly about course objectives, policies, and assignments and listen carefully to your questions and concerns. I will try my best to grade coursework fairly and return it in a timely manner.

Course Activities: Include lectures by the instructor, readings from book chapters and papers, critiques of readings, problem sets, group discussions of the readings, best degradation paper contest, midterm, and a final project that will include an oral presentation and a final paper.

Paper Critiques: During the last hour of class on Thursdays (usually), starting in the 4th week of the course, we will discuss designated papers as a class. A < 2-page (double-spaced) written critique will be due for each reading. The critique will include a brief summary, followed by your assessment of the strengths and weaknesses of the paper and of the impact it has had or will have on the field of ecosystem degradation. During class the article will be discussed with pre-assigned roles determined by the students and instructor. More specific instructions to come.

Problem Sets: 3 problem sets will be assigned throughout the semester to learn how to use various formulas, equations, and models associated with ecosystem degradation.

Best Degradation Paper Contest: An on-going project during the course will be the best degradation paper contest. Students will evaluate peer-reviewed scientific journals to select what they believe is the best degradation paper ever published based on criteria discussed in class (breakthrough discovery, number of times cited, journal impact factor, etc.). This paper may not be on the reading list for the course. Each student will be required to nominate a paper and present their justification to the class orally. The winner will be determined by student voting with the instructor acting as a tie-breaker or making the final decision. A prize will be awarded to the winner(s) in addition to bonus points towards the final grade.

Midterm Exam: There will be an in-class midterm examination that will be given before spring break. It will consist of multiple choice, fill-in-the-blank, matching, short answer, and essay questions. See Course Schedule for date.

Final Project: Students will work individually on a final project. The project will consist of researching a current ecosystem degradation issue of the students' choice. Students will present their findings to the class in an oral presentation at the end of the semester as well as write up a ~ 20-page final report in scientific journal or M.S./Ph.D. thesis type style; see graduate division website.

Grading:

Activity	Quantity	Individual Points	Total Points	% of Grade
Participation	-	-	50	10
Critiques/Best Paper Contest	6/1	10/15	75	15
Leading Class Discussion(s)	1-2	12.5-25	25	5
Problem Sets	3	25	75	15
Midterm	1	100	100	20
Final Project	1	175	175	35
			500	100

Grading Scale: Letter grades will be assigned on the plus/minus system with grades assigned approximately as follows: > 90 % = A, 80-89 % = B, 70-79 % = C, etc.

Other Course Policies

Participation: The 50 participation points will be determined throughout the semester based on attendance, punctuality, attitude, enthusiasm, and participation in course activities.

Late Assignments: Critiques and final project grades will decrease by one level (A to A- or C- to D+) each day following the due date. Assignments will not be accepted more than 5 days after the due date. In case of emergency extensions or absences, the instructor will need to be contacted prior to the due date of the assignment or exam. In such cases, extensions may be granted on an individual basis.

Academic Integrity: Students are expected to act with the utmost integrity. The *University of Hawai'i Mānoa Student Conduct Code* defines cheating and plagiarism as follows:

“**Cheating** includes but is not limited to giving or receiving unauthorized assistance during an examination; obtaining unauthorized information about an examination before it is given; submitting another's work as one's own; using prohibited sources of information during an examination; fabricating or falsifying data in experiments and other research; altering the record of any grade; altering answers after an examination has been submitted; falsifying any official University record; or misrepresenting of facts in order to obtain exemptions from course requirements.

Plagiarism includes but is not limited to submitting, in fulfillment of an academic requirement, any work that has been copied in whole or in part from another individual's work without attributing that borrowed portion to the individual; neglecting to identify as a quotation another's idea and particular phrasing that was not assimilated into the student's language and style or paraphrasing a passage so that the reader is misled as to the source; submitting the same written

or oral or artistic material in more than one course without obtaining authorization from the instructors involved; or "drylabbing," which includes obtaining and using experimental data and laboratory write-ups from other sections of a course or from previous terms."

If you ever have any questions about what constitutes fair academic play, please come and talk to me! Cheating or plagiarism will result in an F for your final grade in the course. It may also lead to other serious academic repercussions beyond this course.

Accommodations for Disabilities: If you feel you need reasonable accommodations because of the impact of a disability, please 1) contact the KOKUA Program (V/T) at 956-7511 or 956-7612 in room 013 of the QLCSS; 2) speak with me privately to discuss your specific needs. I will be happy to work with you and the KOKUA Program to meet your access needs related to your documented disability.

Final Caveat: All material on this syllabus is subject to change at the discretion of the instructor to suit the needs of the course.

TENTATIVE COURSE SCHEDULE NREM 612 Spring 2013

Week (Date)	Lecture/Discussion Topic	Reading Assignment	Other
1 (1-8)	Introductions, Syllabus, Quiz	Vitousek et al. 1997	
1 (1-10)	Historical Context	Barrow 1991 (1-20)	
2 (1-15)	Explanatory Theories	Barrow 1991 (21-30)	Assign PS1
2 (1-17)	Diversity, Stability, Resistance, Resilience; Critique Guidelines	Pimm 1994	
3 (1-22)	Physical Degradation, Discussion Leader Sign Up	Pimentel et al. 1995	
3 (1-24)	Chemical Degradation	IPCC 2007	
4 (1-29)	Biological Degradation	Stone & Loope 1987 &/or Mack et al. 2000	PS1 Due, Assign PS2
4 (1-31)	Discussion 1 , Announce Disc. Leaders	Pimentel et al. 1995 or TBD	Critique 1
5 (2-5)	Human-Dominated Ecosystem (HDE) 1, Forest	Noble & Dirzo 1997	
5 (2-7)	Discussion 2	Nepstad et al. 1999 or TBD	Critique 2
6 (2-12)	HDE 2, Rangeland	Asner et al. 2004	PS2 Due
6 (2-14)	HDE 3, Agriculture	Matson et al. 1997	
7 (2-19)	Discussion 3	Green et al. 2005 or TBD	Critique 3
7 (2-21)	HDE 4, Urban/Suburban	Grimm et al. 2000	Final Proj. Prop. Due
8 (2-26)	HDE 5, Wetland	Barrow 1991 (117-129)	
8 (2-28)	Discussion 4	Richardson et al. 2005 or TBD	Critique 4
9 (3-5)	HDE 6, Coastal	MEA 2005	
9 (3-7)	Discussion 5	Lotze et al. 2006 or TBD	Critique 5
10 (3-12)	Catch Up Day & Review		
10 (3-14)	Mid-Term Examination		
11 (3-19)	HDE 7, Islands	Barrow 1991 (136-139) or TBD	Assign PS3
11 (3-21)	HDE 7, Islands Continued	El-Swaify 2000	
12 (3-	Spring Break		

26)			
12 (3-28)	Spring Break		
13 (4-2)	Discussion 6	Rolett & Diamond 2004 or TBD	Critique 6
13 (4-4)	Degradation Hotspots		
14 (4-9)	Conservation & Restoration, Determine BDPC & FP Order	Dobson et al. 1997	Email me full citation info for BDPC choice
14 (4-11)	Conservation & Restoration Continued		PS3 Due
15 (4-16)	Best Degradation Paper Contest Presentations		Written Justif., Oral Pres. to Class
15 (4-18)	Individual Final Project Meetings		Meet in Sherman 132
16 (4-23)	Catch-Up Day (Possible Final Project Presentations)		
16 (4-25)	Final Project Presentations²		
17 (4-30)	Final Project Presentations²		

¹We will discuss student roles for discussion in class.

²**Hard copy (not email)** of Final Paper due to me by scheduled examination period.