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SO YOU'RE NOT A NATURAL RESOURCES MAJOR: TEACHING A GENERAL STUDIES COURSE FOCUSED ON FOREST HISTORY

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ABSTRACT: When compared to our undergraduate majors, students taking environmental courses to fulfill general education (or general studies) requirements have different knowledge bases, different interest levels, and different motivations for studying natural resources topics. Unlike foresters or wildlife managers or environmental scientists, typical business management, psychology, or accounting students are not inclined to memorize scientific names of X number of tree species or learn how to calculate hard mast yields per acre or care how to precipitate organic compounds from a sample solution. So how and what can we teach these students? How do these differences affect choices of appropriate teaching strategies, lecture topics, reading selections, assignment types, and testing? This paper will address pedagogical issues and rewards discovered while teaching a course titled *Forest History, Technology and Society*, a course that fulfills a general education requirement for students from across campus. The course time frame spans from western civilization's beginning until the contemporary period. Topics include an eclectic mix chosen to prompt examinations of values, perspectives, scientific understandings, and utilization alternatives affecting the status of forests at particular points throughout the span of history. This paper will examine how the interaction of that immense time frame and the eclectic range of potential topics necessitates identification of key concepts on which to focus the course. It will discuss the techniques used in designing assignments and creating examinations for its diverse student clientele with diverse interests and learning styles.

INTRODUCTION

My class roster last semester included students majoring in accounting, animal science, pre-vet, business management, mass communications, and wildlife biology. They ranged from first semester to senior students. Actually, one student had returned to earn a B.S. degree after earning a Masters and taking Ph.D. classes in philosophy. The students' only apparent common trait was that they elected to enroll in FOR 248, which fills a slot in university general education requirements. In that respect, this class is similar to the mix of students one could find in many humanities or social science elective courses taught across campus.

But it is a different student mix than typically enrolls in our other forestry or natural resources courses. Compared to our undergraduate majors in forestry or natural resources, these students have markedly different knowledge bases, different interest levels, and different motivations for studying natural resources topics. They shy away from memorizing scientific names of X-many tree species or learning how to calculate hard mast yields per acre or how to precipitate organic compounds from a sample solution. Still, they have a pervasive sense that the environment matters.

So how and what can I teach these students? How do their differences affect choices of appropriate teaching strategies, lecture topics, reading selections, assignment types, and testing? This paper addresses pedagogical issues and rewards discovered while teaching *Forest History, Technology, and Society*.

COURSE STRUCTURE AND CONTENT

FOR 248 is a typical 3-credit, 3 fifty-minute meetings per week, no laboratory class. Two texts (Perlin 1991, Ponting 1991) currently provide the core reading material, supplemented with a fairly extensive optional reading list. Grading in the course comprises several components (Table 1). After a semester or two, I found that several quizzes and a final examination rather than just a mid-term and final examination worked better to keep everyone on track with the syllabus—me included. I also found that rather than one large-scale research project, several more specific assignments and a smaller-scale research paper helped students better understand some key concepts in the course and prompted them to keep abreast of the reading.

Table 1. Components of FOR 248 course grade

Component	%
Formal assignments (4 @ 5%)	20
Quizzes (3 @ 10%)	30
Project paper	20
Final examination	20
Homework and class participation	10

The course content spans from the dawn of western civilization in the ancient Near East through the contemporary period. However, brief attention to the twentieth century really only concludes the course. I do spend enough time introducing the consequences of modern forest management to dispel some typical misconceptions students bring into the course. Overall, though, course content includes an eclectic topic mix chosen to prompt examinations of values, scientific understandings, and utilization alternatives (Table 2).

For a semester or so, I tried a chronological structure because the main text (Perlin 1991) is essentially a chronological narrative. However, I found myself either plodding or racing through the ages. We could spend most of the semester on the ancient world and then cover the last five hundred years in a few weeks. Instead, we are now addressing themes Perlin touches on in every age and thereby connecting facts and examples from ancient to modern times. My current aim is to develop a central understanding of how forests, technology and society have continually interacted. We tease out the core issues of local versus national interest in wood supplies, domestic versus industrial demands, and utilitarian versus ideological perspectives at work in each time period.

Table 2. Fall 1997 class session allocation to topics

Lecture Theme	# Classes	Assignment Focus
History and Myth : Technology and Science	2	
Phenomena and types of evidence	1	
Agriculture and its effects	5	Universal Soil Loss Equation
Charcoal: the universal fuel	3	
Industry, trade, and development	3	
Resource allocation and political power	3	Optional Readings Summary
Resources, economics and culture shifts	5	
Transportation and wood	5	
New world perspectives	3	Old Growth Site Visit
Wood extraction and extractives	3	
Changing utilization standards through time	3	
Preservation and conservation laws	3	
US introduction of forestry	2	Website Exploration
Forestry's century	2	

This change also resulted from a chance discovery I made while searching for a better way to frame key concepts on which to ground the course. I encountered a list of questions posed by conferees at two meetings convened by the NE Forest Experiment Station to address global change issues (Emery and Paananen 1995). Emery and Paananen's list was developed to guide human dimensions research related to global change. But from that list I extracted ten key questions for my course and students (Table 3). We now proceed through the topics in Table 2, by semester's end accumulating sufficient evidence to answer the questions in Table 3.

Table 3. Key concepts addressed (adapted from Emery and Paananen 1995).

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- What are the effects of human actions on forested ecosystems?
 - How do demographic trends affect forest use?
 - How do various technologies affect the ways people use forests?
 - How will changes in forested ecosystems affect technologies?
 - How do people respond to changes in forested ecosystems?
 - What are the differential effects of forest management actions and environmental changes across social groups and time?
 - What are the tradeoffs among benefits and costs of management and policy options for various stakeholders?
 - What methods can be used to identify and evaluate tradeoffs among benefits and costs of management and policy options for various stakeholders?

What are the interactions between environmental values and changes in forested ecosystems?

How do social constructions of the relationships between nature and humans affect options for responding to change in forested landscapes?

Along the way, I supplement the Perlin and Ponting texts with information from a wide variety of sources. For instance, a chapter from Hughes (1975) provides an overview of Mediterranean ecology, which helps students understand the dynamics of environmental change in the Hellenic and Roman periods. Nora Chadwick's excellent work on the Celts (Chadwick 1971) provides insight about conditions across Europe beyond the pale of classic cultures. I use slides from

the Harvard Diorama series to illustrate impacts of European settlement and subsequent economic developments on the eastern seaboard and a figure from Trimble (1974) to show effects of erosion on the Southeastern piedmont. Two of my own research projects provide examples illustrating relatively recent changes in North American forests. A project concerning Western Maryland demonstrates changes resulting from transportation and industrial developments since the 1770s. The other project treats profound changes in the South's longleaf ecosystem, as a result of naval stores production, hog foraging, agricultural conversion, and timbering as late as the turn of this century.

TEACHING STRATEGIES

As I indicated above, unlike most of our forestry and natural resources classes, FOR 248 does not involve a laboratory. I therefore deliver most of the material in lecture-discussion format, with as much emphasis on discussion as possible. At this point, I want to touch on several assignments and features I have incorporated to stimulate greater student involvement in the learning process. I need to emphasize that nearly all of these assignments are still under construction or renovation. I also assign impromptu overnight homework when I want the class to be especially prepared with a particular section of the reading.

Universal soil loss equation. This assignment I make in conjunction with examining effects of early agricultural and industrial development on forests. It requires that students use procedures for deriving variables in the USDA soil loss equation. They then develop a spread sheet to calculate soil loss values in tons per acre per year for several different soils in North Carolina, under varying canopy conditions. I have them write a brief summary report about their results. The purpose is to emphasize the factors that can and often have led to catastrophic effects from deforestation or poor management practices following timber harvesting. Perlin, of course, presents abundant historic examples, but this exercise tends to reinforce the take home message that cutting trees alone is not so much the problem as what follows the cutting.

Charcoal and Potash Yields. Last year, in conjunction with our discussion of metallurgy's development over several thousand years, I assembled tables and information from the *Forestry Handbook* and generated several problems to calculate amounts of charcoal and potash yielded and the amounts of energy available if using different types of fuelwood. The problems require definitions of terms and understanding of changes in the distillation process over time. We also can discuss differences in wood properties and their effects on utilization.

Eastern Old-Growth Forests. When we begin to shift our focus to North America and European colonization, I introduce Leverett's (Davis 1993) criteria for identifying old growth

stands. I invite the students to visit a site noted in Mary Byrd Davis's survey and to report on what they see, specifically noting the presence or absence of the typical characteristics we have discussed. This fall I scheduled the assignment so they could make these visits over mid-semester break if they wanted to go farther afield.

Website Exploration. This assignment posed a number of questions that required students to visit selected websites to find needed information. For example, from the North Carolina Division of Forest Resources site, they needed to find the price list for seedlings and calculate what it would cost to acquire seedlings for various kinds of plantations. From the Cradle of Forestry website they were to identify states whose National Forest maps were available through the Cradle of Forestry in America Interpretive Association. Next semester I will probably make this one of the early assignments and expand the number of sites they visit, including the USGS Land Use History of North America site and others whose addresses I have recently encountered.

Project Paper. The project paper assignment gives each student the chance to delve into a subject area of personal interest in greater depth than is possible for the whole class. The assignment objectives are to (1) encourage interdisciplinary thinking and investigation, (2) provide experience in developing literature review skills, (3) satisfy intellectual curiosity (mine and theirs) regarding a chosen subject, and (4) provide opportunities for reporting findings in writing. I expect the topic to involve an aspect of history related to forest resource use, an industry utilizing forest resources, or a socio-cultural development impacted by availability of forest resources. Papers typically range between five and ten pages. Table 5 lists some of the representative topics chosen over several semesters.

Table 5. Sample personal research paper topics in FOR 248.

California Redwoods: a look at early logging
 Developments in logging and transportation in the Lake States
 Fire Towers in North Carolina
 Forests of Cuba 1954-1997
 Greek Beliefs and Culture vs. Their Relationship With the Environment
 Government land regulation and endangered species
 Principio Iron Works

In addition to formal assignments, I also take advantage of unplanned situations that arise. For example, this fall our campus art gallery exhibited two shows that related to my class. One was a local potter's work produced in a wood-fired kiln. The other show, called "Fabulous Furniture," featured a number of pieces fashioned in wood. I took the class to the shows while we were discussing utilization standards and wood properties. Most had never even been to the campus gallery, and few would probably have made a connection between the shows

and this course, so we spent a class period connecting forests and art in a tangible way.

COMMUNICATING WITH THE PUBLIC

Surveys reported in the mass media suggest that as many as 80 percent of the U.S. public may identify themselves as concerned about the environment. But the same types of surveys tend to undercut this number's significance. When excesses of consumerism butt up against realities of conservation practice and consumer self-denial, hypocracies of American environmental consciousness surface. Thus, one of my intentions is to raise my students' awareness about our collective and their own consumptive patterns with relation to forests.

Trade-offs, as we in natural resources management know all too well, exist. This course asserts that they have always existed. Because I believe that only through informed management of our domestic forests can we hope to sustain productivity for the multiplicity of uses demanded for the foreseeable future, I attempt to inform each semester's small sample of forest products users about costs associated with their choices. According to comments made by my students in response to several of the assignments, this course changes the way they see the forest and think about its management.

FOR 248 is a course that draws students from across the spectrum we in the natural resources professions refer to as "the general public." The students remind me of myself at a distant past age (and growing more distant all the time). Most come in somewhat naive or misinformed about forest management and the status of our forests, some are pretty idealistic about how resource decisions should or can be made; but to varying degrees all are curious and willing to stretch themselves to understand what affects our forests. They leave changed in some small degree and, I have some evidence to suggest, better understanding issues and facts affecting forest management decisions.

CONCLUSION

Developing and teaching this course has been fun. Its subject matter intrigues me, continually posing questions for which I personally want to seek answers. Perhaps to an extent the curiosity and enthusiasm have been infectious. The students suggest that they are consistently surprised by their "discover-

ies" in the class. When asked whether the course meets their expectations, they often express surprise at how much different it has been from what they thought it might be. Their performance on quizzes and tests is predictably arrayed along that bell curve we academicians keep in the back of our minds. But all seem to have gained something.

I think my inclination to experiment, my personal move into this area of research endeavor, and the variety of perspectives students bring to the course all interact to create a dynamic environment for learning something. I have not codified what exactly that something is beyond the variety of answers one may offer in response to that list of key questions in Table 3. Maybe the something is merely what I call the essence of education—satisfying our curiosity.

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