Coastal Marine Science for Law and Business Students: Preparing Law and Business Professionals to Make "Informed Decisions" About Coastal Issues

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COASTAL MARINE SCIENCE FOR LAW AND BUSINESS STUDENTS: PREPARING LAW AND BUSINESS PROFESSIONALS TO MAKE “INFORMED DECISIONS” ABOUT COASTAL ISSUES.

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Abstract

The rigors of employment-directed undergraduate education, and decreased emphasis on “Liberal Arts” studies occurring at some colleges and universities has left many graduates with a level of scientific understanding which is inadequate to make informed choices about issues which effect the environment. To address this lack of scientific understanding, the Chesapeake Bay National Estuarine Research Reserve (Virginia) and the Virginia Institute of Marine Science, with the Marshall-Wythe School of Law and the School of Business Administration of the College of William and Mary are developing a Coastal Ecosystem Science Program to teach future law and business professionals the basics of coastal marine science.

The Program is being developed after front-end evaluation (telephone survey of law/business faculty members from schools, law and business graduate students and industry professionals from around the United States) which explored the need, successful format, length and other essential or logistical elements of program design. Formative evaluation will continue through student pre-, and post-, testing to evaluate content, information transfer and retention. This program teaches the basic principles of coastal, environmental science to all law and business students (not just those students with experience in environmental science). The goal of this program is to ensure that future lawyers and business leaders will be able to make “informed decisions” about issues which effect the coastal environment.

The development of the program, initial survey and focus group results, essential elements of the program design, evaluation of pilot presentations and plans for pilot-year testing in schools across the country will be discussed.
Introduction

Universities are beginning to realize the importance of interdisciplinary study in addressing the complex issues which face our society (College of William and Mary, 1995). Coincident with this awareness is the growing emphasis on providing students with the basic tools and experiences which will help them to find employment in a changing employment environment (Milliman, 1996).

Yet, the rigors of employment-directed undergraduate education, and decreased emphasis on "Liberal Arts" studies occurring at some colleges and universities has left many graduates with a level of scientific understanding which is inadequate to make informed choices about issues which effect the environment. Levine (1990) makes the dramatic report that one quarter of Americans think the Sun revolves around the Earth and Detjen (1995) reports that more than 63% of all Americans believe that humans lived at the same time as dinosaurs. Some people attribute this failure to comprehend scientific concepts to the general dislike of mathematical principles, and to a lesser extent, the cumulative nature of scientific study (Wolpert, 1993). To countermand inadequacies in scientific understanding there has been a growing call for action in the academic and professional literature to promote environmental education for professional students in law and business (Percival, 1993, Walloga, 1994, Bovet et al., 1994, Hayton, 1991, Shrivastava, 1996, Becker, 1997, Graham and Hartwell, 1997.). This emphasis on environmental education for targeted professional audiences has also been echoed by resource management agencies.

The Office of Coastal Resource Management (OCRM) of the National Oceanic and Atmospheric Administration (NOAA) has strategically planned to work towards sustaining healthy coasts by: (1) protecting, conserving, and restoring coastal habitats and their biodiversity; (2) promoting clean coastal waters to sustain living marine resources and ensure safe recreation, healthy seafood and economic vitality; (3) and by fostering well-planned and revitalized coastal communities that sustain coastal economies, are compatible with the natural environment, minimize the risks from natural hazards and provide access to coastal resources for the public's use and enjoyment (NOAA, 1996). Implicit in this vision is the ability for professionals working in the coastal zone (i.e. scientists, resource managers, politicians, lawyers and business leaders) to work together to sustain healthy coasts. The objectives of NOAA's plan to sustain healthy coasts have both a scientific and resource management component (e.g. protect, conserve and restore...) and a social, political and business component (e.g. well-planned and revitalized coastal communities). Accomplishing these objectives will require the effective cooperation between scientific, legal and business stake-holders.

Sustaining healthy coasts through protecting coastal resources, promoting clean waters and viable fisheries, and fostering well-planned and revitalized coastal communities are complex issues which will require the expertise of attorneys, business professionals and scientists working together to develop realistic and
effective management strategies. Each group must also come prepared with the strong knowledge of its particular field, be it law, science or business. Yet is imperative to this interaction that each particular group have a basic understanding of the context within which the other groups work. Scientists involved in resource management issues must have some basic training in the principles of law and business, while lawyers and business professionals must have a basic understanding of ecosystem functions and processes. Current efforts at both the Virginia Institute of Marine Science/College of William and Mary and the Wood’s Hole Oceanographic Institute are introducing graduate, marine science students to law and business (Milliman, 1996) but opportunities for law students and business students are limited by the rigorous schedules (Marshall-Wythe School of Law, 1993) and a lack of curricular offerings in the environmental sciences (Percival, 1993) for most graduate programs in these fields.

The inability of most graduate students in law and business to take general courses in ecosystem processes (and the un-attractiveness of these courses due to the prerequisites of a broad background in the math and sciences) leaves these students with little scientific training beyond first-year college biology (which rarely addresses ecosystem function but usually focuses on phylogeny and organism systems). This scientific training is inadequate given the role of law and business in resource management decisions.

The Chesapeake Bay National Estuarine Research Reserve in Virginia (CBNERRVA) is a program of the NOAA/NOS Office of Coastal Resource Management’s Sanctuaries and Reserve Division which is managed by the Virginia Institute of Marine Science/College of William and Mary. CBNERRVA is working with the Marshall-Wythe School of Law and the School of Business Administration of the College of William and Mary to address the informational needs of future law and business professionals through the development of a “Coastal Science for Law and Business” educational program.

Situational Assessment

Initial investigation on situational need for a coastal science program directed at law and business students was conducted through a search of academic, professional and popular literature in each of the subject fields (science, law and business). Particular attention was given to assess previous attempts to develop coastal science programs for non-scientific undergraduate and graduate students, suggested format or content of such a program and to evaluate the need for this type of program.

One hundred (600) law and business professors, 600 practicing professionals and 536 law students were surveyed regarding the development of a coastal science program for law and business students. Specific questions addressed: previous environmental topics courses offered (or taken); potential need for a coastal science topics course for law and business students; possible topics to be
addressed in a coastal science course; possible format; and additional comments on this proposed program.

**Initial Survey results**

The results of the faculty and professional survey were not available at the time of this printing and only the student survey results will be discussed in this text. Twenty-one percent of the student surveys were returned for analysis and evaluation. Of the respondents, 33 percent expressed interest in a career as an environmental attorney and nearly 96 percent of the respondents believe that a successful environmental attorney should have at least a "moderate" understanding of scientific principles. Despite this implied, necessary, knowledge of scientific principles only 5 percent of the students reported any course work in ecology or hydrology (fundamental elements of environmental sciences).

Fifteen percent of the respondents would "definitely" take a "science for lawyers" course and an additional 15 percent of the respondents stated that they would "probably" take the same course, if offered. The topics deemed most necessary by the students surveyed include: (34%) coastal ecology, (35%) science of endangered species protection, (51%) environmental risk assessment, and (32%) wetlands ecology.

**Coastal Science for Law and Business Students**

Initial results of the student survey have indicated the apparent need for, interest in and topic suggestions for the development of a "coastal science for law and business graduate students" program. Analysis of the faculty and professional group surveys will be compared to the student survey results in consideration of this on-going project. If encouragement for the further development of this project is indicated by the surveys, faculty and professional group survey results will provide insight and direction in program and presentation format, structure and other course logistics.

Pilot testing of the "coastal science for law and business" program is scheduled to begin during the 1998/1999 academic year. Continued evaluation of the program will include student pre- and post-testing, and through student, and faculty, post-program focus groups.

We are working to support and expand this project so that it will continue to develop to the end that we will ensure that future lawyers, politicians and business leaders will be able to "make informed decisions" about issues which effect coastal environments and resources.
References


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