

**THE FUTURE OF GRADUATE ENVIRONMENTAL STUDIES:
SOME EDUCATIONAL CONSIDERATIONS**
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ABSTRACT

This paper will review six challenging tensions that are intrinsic to curriculum, training, and career preparation in Masters and PHD programs in Environmental Studies. These are the meaning of interdisciplinary, the substantive foundations of curriculum, the role of theory and practice, research approaches, experimental pedagogy, and developmental/cognitive sequences. I will review these “tensions” from the perspective of thirty-five years of curriculum and program development experience and as witness to the international growth and development of academic environmental studies (1970-2005).

Here are the tensions in brief. They should be viewed as dynamic and interconnected, as opposed to either/or dichotomies. There is still considerable debate as to whether environmental issues are best approached by disciplinary “experts” who bring the methods of their discipline to a complex problem, or by transdisciplinary synthesists who delve into various subject areas as needed. A related, but distinct challenge is the debate between the virtues of a “liberal” substantive foundation, which gives equal weight to natural sciences, social sciences, and the arts and humanities, versus a more specialized orientation. These issues are often framed within the context of theory and practice. How important are rigorous theoretical approaches versus hands-on, skill-based, field learning? What research orientation best supports the work—empirical, quantitative, statistical approaches or phenomenological, participatory, qualitative approaches? Environmental studies courses (in all subject areas) offer a range of pedagogies, from expert-model, didactic approaches to more experimental, constructivist, multiple learning style methods. Finally, what is the role of developmental and cognitive learning models in conceiving the sequence of curriculum? There is the traditional approach of using building blocks of knowledge to experimental approaches that consider the relationships between perception, identity and cognition as a means to teach ecological concepts, or as a way to incorporate scale.

My hypothesis is that academic environmental studies is a perennially adapting field responding to a range of substantive issues. Programs are best served by dwelling at the confluence of these educational tensions. I will advocate a pluralistic pedagogy that offers students, faculty, and programs the maximum flexibility in order to reflect the dynamic subject matter.

Environmental Studies is Emergent, Responsive, and Dynamic

I teach an Ecological Thought course for first year PHD students in an interdisciplinary environmental studies program at Antioch New England Graduate School. Early in the class, I break the students into groups of three, hand them sufficient newsprint, and ask them to write down every word they can think of that has eco, green,

or environmental as a prefix. Within twenty minutes they will generate several hundred words (e.g., ecophilosophy, green business, ecological economics, environmental sociology, etc.). What's remarkable about this list is that the entire lexicon consists of words, concepts, and ideas that have mainly emerged in the last thirty years.

Environmental studies scholars and practitioners contribute to this remarkable proliferation, reflected in a dynamic literature, and hundreds (even thousands) of new academic programs and professional approaches. In the field of environmental science, resilient and powerful concepts such as global environmental change, variable scalar hierarchies, patch dynamics, habitat fragmentation, and biodiversity, among others have permeated the profession in one generation. Consider, too, the extraordinary improvements in instrumentation and data collection, allowing for complex paleoecological, biogeochemical, and atmospheric modeling and interpretation. To consider the "future of environmental studies" it's crucial to remember that the subject matter, conceptualizations and theories that inform the field are dynamic, emerging, and complex.

Another distinguishing characteristic of environmental studies is that it is a responsive field, challenged by a sense of urgency and necessity. Just about anyone who chooses to enter the environmental profession does so not only because the subject matter is of interest, but also out of a sense of mission. My experience with over a thousand environmental studies graduate students suggests that they enter the field because they are responding to what they perceive as urgent contemporary issues requiring immediate attention and amelioration. Out of this necessity, environmental studies programs often focus on the tangible skills, contingencies and requirements of applied training. Hence, environmental studies programs are continuously balancing the dynamic changes in subject matter, novel and emerging contemporary issues, and the specific skills that contribute to real professional outcomes.

Consider, too, that many aspiring environmental professionals and scholars undergo a personal transformation as they study environmental issues. In an earlier work, *Ecological Identity: Becoming a Reflective Practitioner*¹ (The MIT Press, 1995), I suggest that immersion in environmental studies challenges and molds individuals at the level of personal identity, broadening the concept of land, community, and agency so that it encompasses species, habitats, and the biosphere. The study and practice of ecology and environmental studies presents challenging scientific, conceptual, metaphorical and even spiritual ideas regarding scale, posterity, and legacy, with implications for notions of identity, service, and citizenship.

Finally we must ask, what purpose does graduate environmental studies serve? Obviously, every program will have a different orientation depending on its academic strengths and educational philosophy. Similarly, every student who chooses such preparation will have a unique rationale for doing so. Nevertheless, most environmental studies scholars and professionals would probably agree that there is a consensual overriding purpose—the biosphere is in the throes of unprecedented anthropogenic-

¹ Mitchell Thomashow, *Ecological Identity: Becoming a Reflective Environmentalist*

induced change, and humanity must devote its best thinking and intellectual resources to better understand the consequences of these changes. This orientation is the basis behind dozens of local and global collaborations, including the International Geosphere Biosphere Programme, and other consortiums and organizations that are researching biospheric change and global sustainability. That is, environmental studies programs, regardless of their orientation, are linked to an emerging global environmental initiative of historic importance.

These patterns—an emerging subject matter, an urgent context, the profound transformational implications of the material, and the global environmental initiative—necessarily inform how we consider the future of environmental studies. Let us assume that the field will change as much in the next thirty years as it has in the previous thirty. Undoubtedly, the combination of new, unprecedented issues, along with increased computing power, will suggest entirely new, even paradigmatic shifts in conceptualization, raising the intellectual and professional stakes even higher than they are today. Indeed, it may be impossible to predict future training needs, or even to envision what an environmental professional may need to know thirty years from now. As such, environmental studies programs will necessarily be adaptable, resilient, and improvisational, as they try to balance their own need to develop standards and foundations in contrast to the responsiveness required by the issues.

If the history of environmental studies is a useful guide, then it may well be that regardless of the rapid changes in the field, there are a series of perennial educational questions that inform how we teach and learn. Donald Worster, in his landmark book Nature's Economy: A History of Ecological Ideas², demonstrates how ecology since its inception in the late 1890's has spawned an intriguing dialectic of both narrative and quantitative approaches, romantic and industrial metaphors, field-based/naturalist versus laboratory-based inquiry, and how these controversies pervade amongst changing historical circumstances. Such philosophical and ultimately pedagogical trends are to be expected in a field that has so much substantive change. We seek resilience in having a grounded philosophy of learning, providing ballast and clarity in the face of uncertainty. We may not be able to predict emerging subject matter as we consider the future of environmental studies, but we can assess the virtues of various approaches to learning and thinking. The remainder of this essay is devoted to exploring the six educational tensions that pervade how we think about the future of graduate environmental studies.

Why Interdisciplinary?

In the stunning flagship volume of The International Geosphere Biosphere Series of books on global change, Global Change and the Earth System, there is a section “Making Earth System Science” which lays out a research agenda, aimed at developing a “substantive science of integration.” It is instructive to read the five characteristics of an “integrative earth system science.”

² Donald Worster, *Nature's Economy: A History of Ecological Ideas*

- “continue to support and facilitate the study of pieces of the planetary machinery in fine detail, but also place them into broad conceptual frameworks that are built around a systems perspective;
- embed the insights of this classical analytical science—the identification of cause-effect relationships—into complex systems analysis which directly addresses the synergies, interactions, switches/triggers, non-linearities, and emergent system properties that defy the traditional approaches on its own;
- develop increasingly sophisticated ways of examining the roles of biospheric and specifically anthropogenic processes within the Earth System;
- develop increasingly realistic ways of responding to ‘what if?’ questions of vital concern for future sustainability; and
- transcend disciplinary boundaries across the natural and social sciences by linking the concepts, skills, and insights across the biophysical/socio-cultural divide in exciting new combinations from problem definition to the communication of findings in a world of great cultural and socioeconomic diversity.”³

Note how this research agenda deals with the question of interdisciplinarity. It assumes that more traditional disciplinary approaches to learning and research are mainly effective at identifying cause-effect relationships, but that such knowledge should be placed in a broader systemic context. Implicit in this assessment is the possibility that traditional disciplinary approaches may be incapable of transcending their conceptual limits, and perhaps unwittingly unable to even perceive the depth of the problems they may be assigned to solve. Yet most institutions of higher education are structured within a disciplinary architecture. Indeed, many environmental studies programs, despite their most interdisciplinary vows, are imprisoned by this structure. The issue is less about the virtues of disciplinary versus interdisciplinary approaches, and more about assigning the correct approach to the most relevant problem.

The IGBP study further suggests that “most environmental systems are characterized by a multitude of non-linear internal interactions and external forcings,” recommending a “typology of Earth System regularities” including non-linearities, thresholds, irreversible changes, indeterminacy, complexity and emerging properties, and scaling effects.⁴ When the authors suggest “new combinations” as an approach to transcend disciplinary boundaries, they are referring to substantive reconfigurations. As a prerequisite for learning about global change and human sustainability, one might for example, ask all environmental studies students to take a course in biogeochemical cycles, as the basis for learning biology and chemistry, rather than the other way around. In effect, the student then approaches the traditional disciplines in an unconventional way. One could even ask why bother with such discrete fields as biology and chemistry, which merely reflect the state of eighteenth and nineteenth century data availability at such an early time in the development of scientific thinking.

Most readers of this essay have furiously debated this issue and probably have a strongly held view one way or the other. It is surprising how many people in

³ Will Steffen, et. al., *Global Change and the Earth System*, p. 264.

⁴ Steffen, p. 265.

environmental studies, or for that matter any interdisciplinary field, will fervently argue that a disciplinary foundation is crucial to advanced interdisciplinary insights. Of course, the counter argument is that such disciplinary preparation actually inhibits the ability to conceptualize certain kinds of complex subjects, and that one can always use disciplinary approaches to determine cause and effect relationships, but first you must understand the depth of the problem. Perhaps I should reveal my strong bias, based on all of my training, in support of a progressive interdisciplinarity. Yet, I am convinced, too, that the strength of any graduate program in environmental studies is the diversity of conceptual approaches it contains. Such a pluralistic view requires the uneasy coexistence of a variety of approaches as determined by the learning style and the subject matter.

What Environmental Practitioners Should Know

The relative virtues of interdisciplinarity are embedded in perennial questions regarding what environmental studies scholars and practitioners should know and study. I chair the Environmental Studies Department at Antioch New England Graduate School which has six masters programs (Conservation Biology, Resource Management and Administration, Environmental Advocacy and Organizing, Environmental Education, Teacher Certification, and Individualized). These are two year, fifty credit programs that have a strong practitioner orientation. Our educational philosophy emphasizes the importance of training our students to be effective environmental professionals. All Masters students are required to take eighteen credits of foundation courses in three areas, Natural Communities, Biosphere Science, and Civic Ecology. Our faculty made a concerted effort to describe these foundation areas with interdisciplinary titles. What constellation of coursework do any of those rubrics suggest? The answer often depends on a faculty member or student's programmatic affiliation.

These courses are subject to constant scrutiny and controversy. Some faculty emphasize that in training our students for successful professional practice, it's crucial that we offer them skill-based approaches, and that we design our foundation courses accordingly. Others emphasize that the strength of our training is in our "liberal arts" approach to these foundation courses, and that our students are better thinkers if they take courses such as "Literature of the Land" or "Music and Nature." Hence even interdisciplinary environmental studies scholars will have their substantive preferences, advocating the virtues of their approach, within the context of skill-based practitioner training. In my view, controversies such as these can never be completely resolved.

I am an advocate for a strong humanities voice in the preparation of environmental studies scholars and professionals. My interpretation of the IGBP research agenda is that implicit in issues of global environmental change and human sustainability are questions about meaning and purpose, quality of life, ethics and right livelihood. Even the most technically oriented environmental professional should be equipped to deal with such questions. Still, in many cases I will yield to the preferences of students and/or faculty members who can demonstrate the necessity of an alternative path, reflecting their individualized learning objectives. I am suspect of a faculty so determined in their view that they would be either dogmatic or complacent in thinking through such basic

questions as the substantive emphases of foundation courses. It's instructive to periodically revisit how we construct foundation knowledge. Indeed, by doing so, and by soliciting a wide range of views, we maintain the vitality and resilience of the environmental profession.

The urgency and necessity of environmental training brings the issue of theory and practice to the center of educational philosophy. Historically, academic environmental studies has placed a high premium on applied professional learning situations, emphasizing internships, service learning approaches, laboratories, collaborative working environments, and close communications with prospective employers. Many of the most successful graduate programs, especially at the Masters level require some kind of internship experience.

Theory and Practice

The integration of theory and practice manifests itself not only in the number of credits devoted to internships, theses, and service learning, but also in the actual teaching of the subject matter. Should ecology classes be theoretical or field-based? Should environmental policy courses involve broad coverage of theoretical political economy, or should they have a hands-on, case-study approach? To what extent should college and university environmental studies programs involve themselves in local, controversial environmental issues?

The gist of the tension is that the "urgency and necessity" of contemporary environmental issues would overemphasize case study at the expense of a deeper theoretical understanding. Conversely, too much time spent on theory is too abstract and cerebral, perhaps neglecting the learning that can only come from real world experience. Environmental studies scholars and practitioners should keep this tension vital, insuring a balance, allowing theory and practice to reinforce and challenge each other. This tension also reiterates the issues of interdisciplinarity and/or what people should know and learn. For example, reflective environmental practice, may evoke a renewed emphasis on ethical and philosophical concerns. Or a real world internship may help a scholar or professional realize the importance of some subject matter that she previously underestimated.

Interestingly, "adult learners," especially those with significant practitioner experience, often have much greater interest in theoretical approaches, as they yearn for both epistemological and methodological perspectives. Younger students who have less "real world experience" are often strong advocates for skill-based coursework that will help them secure employment. Regardless of experience, it's crucial that environmental studies academics and practitioners understand the historical, philosophical, and ethical origins of their field. Without that background, they lack the context for both effective decision-making and/or resilient research.

Environmental studies is most resilient when there is a reciprocation between real world experience and theoretical perspectives. An excellent example of a theory and

practice feedback loop is an approach such as adaptive management, an interesting consequence of reflective practice. Policymakers and theorists alike realized that the number of variables in ecosystem management were so complex and numerous that preconceived notions of how to proceed were doomed to failure. Hence a new theory emerged, taking into account the role of the policymaker in complex situations, in which behavioral variables, ecological dynamics, and political orientations, created complexity, uncertainty, and extraordinary variability. A theory such as adaptive management suggests that such complexity is inherent in ecosystem management, and theorists and practitioners alike benefit from having an approach that enables them to deal with dynamic change.

Methodological Pluralism

To these tensions of interdisciplinarity, substantive orientation, and the role of theory and practice, we can add a fourth dimension, the epistemological and methodological aspects of research. What thought process informs our research? What tools do we use to gather data? What interpretive methods enable us to assess the data? How does our interpretation inform both theory and practice? These questions are obviously crucial for any educational process that involves thesis or dissertation preparation, but are also important for any environmental studies practitioner. An interdisciplinary field such as environmental studies can draw on numerous quantitative and qualitative research traditions. Indeed, the variety of approaches can be daunting for any researcher. Educators who emphasize a more traditional, disciplinary foundation for interdisciplinary learning will suggest that the student must first learn the research tradition of a discipline and then move on to a range of approaches. The contrasting view suggests that real world situations demand unique research approaches, and that each issue requires an individualized research approach, drawn ideally from multiple research traditions.

Consider the emerging field of conservation biology. One can persuasively argue that any conservation biologist requires basic statistical research methods, which can be applied in numerous field situations. There are a range of sampling methodologies, inventory techniques, and data assessment tools that are a prerequisite for field ecology. Yet, what about the student who is interested in researching indigenous attitudes towards conservation in areas adjacent to preserved wild lands? A statistically oriented social science project might work here, but there are narrative research methods such as narrative analysis, grounded theory, and action research that might be more relevant. A one or two year-long Masters program couldn't possibly provide the student with all of these tools. Even PhD programs aren't long enough to provide the depth of literature review and practice for a person to become versed in all of these methods.

For interdisciplinary environmental studies, the responsible academic and practitioner, at the very least, must be aware of the wide range of research tools that are available. I advocate "methodological pluralism," an approach by which students are exposed to a wide variety of research approaches, and use them as they are applicable to the unique research situation. Methodological pluralism requires an epistemological orientation. The researcher must understand how any research approach intends to construct knowledge,

and how its designs and tools reflect that orientation. Most real world research problems demand a combination of approaches. The challenge for the interdisciplinary researcher is in knowing which tools to use in which situations, how to combine or utilize multiple research approaches, and how to work with teams of researchers who use different methods. Increasingly, we are seeing research initiatives that combine methods— narrative analyses that use quantitative coding techniques, policy case studies that use rhetorical analyses, or field ecology projects that use multi-scalar data gathering approaches. Such multi-scalar, pluralistic approaches are intrinsic to interdisciplinary inquiry. Intriguingly, they yield original research approaches in their own right, e.g., adaptive management, and I anticipate that the future of environmental studies will include new methodological approaches derived from these syntheses.

Multiple Learning Approaches

Parallel to the emergence of interdisciplinary environmental studies (1970-2005), is the proliferation of interesting teaching approaches and techniques. Participatory learning approaches have expanded the tradition of didactic teaching to include role playing, computer simulation, case studies, as well as a variety of constructivist methods that encourage students to discover principles based in their own experience. Similarly, new approaches to cognitive theory, including Howard Gardner's theory of multiple intelligences⁵, suggest that different learners have different proclivities, and good teaching should allow for a variety of learning pathways, depending on the subject matter, and the individual and/or group learning style.

New approaches to teaching and learning form an appropriate correspondence with interdisciplinary environmental studies, ideally spawning a variety of experimental techniques to reflect the complex subject matter. For an introductory "foundations course," Ecological Thought, in an interdisciplinary doctoral program in environmental studies, I invited three different scientists to visit a similar landscape on three consecutive days. On day one, a physical geographer, with research interests in paleoecology guided us through the landscape. He was followed by a landscape ecologist whose primary interest is community ecology. On the third day, we worked with a wildlife ecologist with primary interests in biodiversity theory and seed dispersal mechanisms. In each case, I asked the guest instructor to set up a series of interpretive inquiries that would allow the students to make their own assessments of the landscape. On day four, I offered my own expertise as an educator who is interested in what I describe as "place-based perceptual ecology," linking identity, perception, and narrative as an approach to learning how to observe natural environments.

My intention was to model a pedagogy, using multiple perspectives, to lay the groundwork for a simultaneous class in research epistemology. Here was a blend of didactic methods—the instructors provided readings and also presented field lectures—with a constructivist orientation. We asked the students to generate their own observations, interpretations and theories. Their research theory class asked them to develop a research project and then investigate how they would use different

⁵ Howard Gardner, *Frames of Mind: The Theory of Multiple Intelligences*.

epistemological approaches to develop a methodological orientation. Didactic lectures about various research traditions were integrated with this participatory assignment.

For my entire career as an environmental educator, I have experimented with various teaching techniques, all designed to cultivate interdisciplinary learning. In developing both Masters and Doctoral programs, and grappling with all of the attendant curricular issues, I have always assumed that interdisciplinary environmental studies requires an emerging, innovative pedagogy. I try to be open to whatever teaching approach fits the learning situation. In my own teaching, I stress narrative approaches, including autobiography, reflective practice, perceptual experimentation, the use of art and music, and various interpretive methods. For the courses I teach in Ecological Thought, Environmental History and Philosophy, and Global Environmental Change, these approaches have worked extremely well. Indeed, in my teaching and research alike, I have used this emerging pedagogy as a means to collect and interpret data regarding how people learn to observe nature. However, I equally support more traditional, lecture based, didactic approaches for subject matter and learning styles that require this. The future of environmental studies necessarily encompasses a variety of pedagogies—they all strengthen each other.

Cognitive Theory and Environmental Learning

Many of the crucial conceptual relationships in interdisciplinary environmental studies are complex, interconnected, and non-linear. Consider some of the seminal concepts of environmental learning—biogeochemical cycles, geological time scale, variable scalar hierarchies, global environmental change, biodiversity, patches and mosaics, adaptive management, just to name a few. Consider the typology of Earth System irregularities, as outlined in the IGBP Series volume described earlier, Global Change and the Earth System—non-linearity; thresholds, hysteresis, and irreversible changes; indeterminacy; complexity and emerging properties; and scaling effects.⁶ These are extremely demanding cognitive notions, requiring a sophisticated understanding of spatial and temporal variation. What sequence of curriculum (K-graduate) is necessary for learning these concepts and relationships? By what criteria do we make this assessment?

The conceptual Holy Grail for environmental studies pedagogy is linking developmental and cognitive theory to environmental learning. We need a generation of “ecological Piagets” who can spawn a series of research projects to find out from a cross-cultural, evolutionary perspective the various developmental sequences, across the lifespan, that promote environmental learning. At what age do you teach an elementary school student about the geological time scale? Young children are interested in dinosaurs. Does that imply an interest in the history of life on earth? Or does it imply a fascination for things that are different? Or does it reflect an interest in predator/prey relationships? Montessori teachers suggest that very young children can grasp the notion of infinity. But how do they know that to be true?

⁶ Steffen, p. 265-267.

Interdisciplinary environmental studies entails an understanding of social and political concepts such as identity, agency, quality of life, citizenship, legacy, and posterity. It implies an understanding of philosophical, ethical, and even spiritual questions related to meaning and purpose, the role of humanity, right livelihood, and materialism. How should these issues be taught? Is there an appropriate developmental/cognitive sequence for addressing them?

Taken together, these educational challenges, reflect the exciting frontier of environmental learning. The future of environmental studies requires an emphasis on how we learn, what we know, and why we bother. As a continually emerging, dynamic, and responsive field, interdisciplinary environmental studies requires a dynamic, research informed pedagogy, that matches cognition to learning. Otherwise, we will rely on anecdote and hearsay to guide us. To take its place as an ascending field, with a deep and resilient literature, environmental studies must elevate it's pedagogy so that it reflects the heart of its teaching—an emphasis on an ecological, evolutionary, and biospheric contexts for teaching and learning.

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