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On Teaching World Forest History

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NANCY LANGSTON

# REFLECTIONS: ON TEACHING WORLD forest history

SHORTLY BEFORE I came up for tenure, my department chair told me that he thought forest history was boring. Since my tenure case was based on forest history, this offhand remark brought out all the neuroses common to pre-tenured faculty—yet I secretly agreed with him. Forest history *is* often tedious. Too much forest history gets mired in detail that appeals mostly to retirees who share an unusual obsession with steam donkeys and railroad lines. Or it can devolve into lists of trees cut, taxes assessed, and mills constructed. Trying to get students to register for a forest history class, I feared, would be like trying to get them to sign up for voluntary root canals. The first two times I co-taught a forest history seminar, my co-instructors and I actually invented course titles that disguised the fact that we were teaching forest history.

Yet, for all that forest history bores people, forests themselves are much more interesting. Students care tremendously about deforestation, and anyone with even a casual interest in the environment can reel off depressing statistics about tropical deforestation's effects on biodiversity, poverty, and global warming. Students see forests as the loci for some of the worst environmental problems in the world today. Impressed by student concern about global deforestation, I agreed to teach a seminar in world forest history, curious to see if I could convince students (and myself) that forest history was a useful way of understanding the problems facing global forests. The seminar gave me the chance to reflect on the state of world forest history: what its strengths and weaknesses are, where it is going as a field, and why we ought to care.

In designing the course, I wanted to capture students' passionate concern about globalization's effects on forests, and I wanted to show them that a historical approach could lead to a better understanding of both the causes and the solutions to these problems. I had two core convictions at the heart of my understanding of world forest history. First, forests aren't just about trees; we need to look at

environmental history's tripartite connections between the realms of economy, ecology, and culture to understand forest change. Second, forest history has real ramifications for policy decisions. As much as historians might want to stay separate from policy, foresters and policy makers use assumptions about history to make decisions, and historians should pay attention to that process. History matters: It's not just about understanding the past; it's necessary for creating a better future.

The obvious structure for a world forest history course would have been chronological, and the obvious textbook would have been Michael Williams's *Deforesting the Earth*, a stellar work that, as the title suggests, begins in prehistory and ends with the twentieth century.<sup>1</sup> Williams's work had not yet come out in paperback, however, so it cost too much for me to assign. While initially frustrating, this turned out to be helpful since it allowed me to avoid a chronological structure. Such a structure is most familiar to professional historians, but I found that for students, it can limit their understanding of the patterns and processes that have affected deforestation across different time periods and regions. Instead, I structured the course thematically, focusing on the interconnections between nature, culture, and modes of production.

With two exceptions, the students in the seminar weren't historians or foresters (historians seem to think trees aren't interesting; foresters are too busy fulfilling technical requirements to think about social issues—and both these responses are revealing). Rather, they were seniors majoring in conservation biology or master's students in environmental studies or rural sociology. They already knew a fair bit about ecological processes of landscape change, so we didn't need to spend as much time on ecology as we would have if this had been a class of historians. Their understanding of history, culture, and social processes was less convincing; by and large, they believed history meant chronology and culture was irrelevant.

Most of the undergraduates came to class with a story of conservation that was quite simple: Bad corporations destroy forests; good conservationists create parks and laws to save those forests; bad corporations find ways to evade those protections. Most of them knew nothing about the issue of land tenure, the history of forest regulation as a successive restriction of customary access to the forest, or the rocky role of the state in forest conservation. They knew next to nothing about the complex web of myths, stories, fears, and cultural histories that people bring with them to their encounters with forests.

To complicate their understanding of their own assumptions and certainties, I started the course with a popular diatribe against corporate forestry titled *Strangely Like War*.<sup>2</sup> This book presented a version of an environmentalist narrative that was so simple and so extreme—deforestation is always a result of corporate greed—that all the students could see something was lacking. Assigning a bad book may seem perverse, but it can be quite useful (especially if that book is short and entertaining to read). The book gave students a fairly accurate sense of the extent of global deforestation, and more important, it clearly laid out the assumptions that many of the students held about the reasons for that deforestation. The flaws were obvious to the graduate students, and this

stimulated a lively discussion that helped all the students confront the assumptions they brought with them to the class.

We then turned to three different works that explored the biophysical, social, and cultural processes shaping the deforestation described in *Strangely Like War*. Using works by the historical ecologists Emily Russell and David Foster, we started by examining the biotic and abiotic factors that shape forest change.<sup>3</sup> Plant communities, disturbances such as fires, floods, insect epidemics, soil processes, and hydrological processes are major (but often overlooked) players in forest history. How did ecological constraints affect the land's response to management? How did management change the paths of forest history? Students were impressed by the ways plant ecologists were using the insights of environmental history in their understandings of landscape change, and they were equally intrigued by the conservation policy implications of these new landscape histories.

We then turned to social processes, examining the role of economics, globalization, and modern states in shaping forest change. Over the course of several centuries, forest communities have been transformed into a collection of resources exported out of a given region to feed the demands of distant markets. How did customary access to forests change as a result? Who determined who would have access to forest resources? How did different groups negotiate conflicts over who should determine the rate and extent of extraction? How did government officials respond to pressures to make common resources available for private profit?

For this theme, the major reading was James Scott's *Seeing Like a State*, an excellent book for getting students to think about the role of the state, economics, and land tenure.<sup>4</sup> Many critiques of industrial forestry have noted that ecological simplification has been a problematic byproduct of forestry; Scott's critique is unique in connecting this ecological simplification to a larger state project.<sup>5</sup> Analyzing Scott's work allowed us to examine some key questions: What are the connections between ecological simplification and government power? Why do bureaucrats and governments so often try to simplify ecosystems? How does land tenure affect forest change?

Scott argues that from the rise of the modern state in the eighteenth century, those in authority have tried to organize society and ecosystems through centralized, top-down plans that simplify human and ecological connections, to further the state functions of taxation, conscription, and maximization of the state's resources. Scott shows how centralized planning and high modernism often have led to ecological and human disaster.

Scott's work made us directly engage with land tenure—the question of who has had access to the forest. While community foresters and political ecologists have long struggled with questions of land tenure, most forest historians have not tended to make land tenure central to their analyses. But understanding access to the forest, property rights, and the effects that changes in those legal systems have on forest ecosystems and human communities, emerged as the most important organizing theme of the seminar (much to my surprise). As Lynne Heasley and Raymond Guries have argued, property rights define the relationships between people and forests, yet property rights are not static

systems. The meanings of property are dynamic, and as institutions change within a society, so too do beliefs about property and access to forests. Property rights create relationships that are fluid yet often naturalized in such a way that their historical contingency becomes invisible to people who wield these rights to control the behavior of others.<sup>6</sup>

Across the world, it is a reasonable generalization to state that most forests were traditionally some form of common property. No single person owned all the rights to a forest; unlike agricultural lands, which did tend to be individual private property in many cultures, forests had broader—but not unrestricted—access. Customary tenure systems traditionally regulated access to common property resources within a forest such as fuel wood, grazing, and what foresters now awkwardly term “non-timber forest resources” such as berries and game. Customary tenure systems were based not on the authority of a centralized state, but rather on “the values of a particular social group, and it is these values which confer legitimacy on local decision-making. Since patterns of interest within a particular social group continually evolve, due to changing conditions, such as population pressure and the value of resources, so the customs and practice in relation to how resources are managed will also evolve.”<sup>7</sup> Customary tenure systems weren’t perfect, of course, nor were they necessarily equitable. Powerful groups within a community could enjoy preferential access to certain resources, and socially marginal groups (such as women) often were excluded from resource use.

With the growing power of the state, statutory tenure codes were drawn up by centralized governments, reflecting the values and interests of the state. One of the major forces behind the compulsory enclosures, Scott argues, was the tax collectors, who wanted a more detailed and accurate map of who owned and owed what. Customary tenure systems favored local knowledge, while statutory systems favored professional knowledge. Power shifted from those who knew the land to those who knew the law. As Scott argues, “state simplifications such as maps, censuses, cadastral lists, and standard units of measurement represent techniques for grasping a large and complex reality; in order for officials to be able to comprehend aspects of the ensemble, that complex reality must be reduced to schematic categories.”<sup>8</sup>

One of Scott’s key examples is silviculture, which makes this work particularly valuable for a forest history class. For tax purposes, German foresters had to figure out a way to measure standing timber, and the most efficient and accurate way to do so was to legislate that the only legal forest was the measurable, regulated forest. The state simplified forests and land tenure systems to make forests easier to tax, regulate, and—ultimately—control.

Scott and Richard Tucker’s *Insatiable Appetite* were enormously provocative.<sup>9</sup> However, I wanted the students to consider that it wasn’t enough to focus on material conditions such as state power, property rights, regulation, or economics. We also needed to pay attention to culture: the intellectual, spiritual, and religious networks of beliefs that affect peoples’ relationships with the natural world. The next section of the seminar had students grapple with questions such as: How did cultural ideals affect the ways different groups of people changed forests? What kinds of visions of the relationship between humans and nature did people

bring to forests? How did these visions shape the land? In particular, for the scientific foresters that shaped nineteenth- and twentieth-century forests around the world, what scientific visions of the forest shaped their work? In which political and cultural contexts did these scientific theories develop? How did foresters' scientific ideas and technology shape forests? How have different cultural perceptions of forests shaped forest management?

To approach these questions, we used the literary scholar Robert Harrison's brilliant and frustrating book, *Forests*.<sup>10</sup> Scott and Harrison agree that, from the Enlightenment on, forest scientists and bureaucrats worked hard to make the forest legible, a place of numbers, growth rates, board feet, and statistics. Harrison complicates Scott's argument, showing that the desire to simplify and to protect the forest comes not just from the modern state's need to tax and govern, but from much deeper roots in our psyches.

Western civilization has defined itself in relation to the forest, according to Harrison. Harrison argues that binary distinctions—between right and wrong, male and female, order and chaos, light and dark, history and the future—lie at the basis of civilization and patriarchy. Yet it is these distinctions and dualisms that the wild forest continually confuses. Forests have a way of destabilizing and reversing simple matters of right and wrong, natural and cultural. Outside the boundaries of society lies the forest, a place of refuge for outcasts, the mad, lovers, hermits and saints, and lepers. While doctrinal Christian attitudes toward forests were essentially hostile, for example, saints' legends tell a different story: One devout soul after another took to the forest, and in its refuge they lived in the intimate presence of their god. Laws go astray in the forests. Conventional distinctions collapse; the profane becomes sacred; the outlaw becomes the guardian of higher justice; the virtuous knight turns into a wild man; the wild man turns into a virtuous man; and the straight way becomes a circuitous path. Forests unsettle, they overturn stability, they confuse clear distinctions—but in that confusion, profound learning can occur. Forests aren't just places of fear and evil. They are places of transformation, places where the human and wild meet and get entangled in a web of myth, ritual, stories, worship, and fear.

The Scientific Revolution and the Enlightenment attempted to empty the forests of this confusion. They tried to make the forests places purely of reason and production, where all that mattered about a forest was what it could produce for human needs. With the rise of rational forest management in the eighteenth century, forests became the object of a new science, which tried to reduce the messy, fertile complexity of myth and undergrowth to timber. An entire science of measuring the wood in a forest sprung up, and the definition of a forest became little more than its timber.

Harrison's arguments about the psychological motives behind the emergence of rational forest science aren't supported by the kinds of evidence that satisfy a historian. Harrison is a literary theorist, not a social scientist, and students found themselves provoked, confused, overwhelmed, and frustrated by his book. Yet, by the end of the semester, this was the book that most illuminated their understandings of the complex causations behind forest change. Harrison didn't motivate any students to become literary critics, but his work was fundamental

for getting students to interrogate the other works we read with a more nuanced set of questions.

After Harrison, we were halfway through the course. We had read more ecology, social science, and literary theory than any student expected. It was time to turn to forest history, which meant a set of detailed but isolated case studies. The thematic readings gave students the tools to approach case studies not as isolated incidents, but as part of (or challenges to) larger patterns. The first half of the seminar had helped set up a theoretical framework for reading these case studies, allowing us to compare them across continents and across centuries.

Our case studies started with deforestation—the act of cutting trees. Then we looked at the repercussions of cutting trees, focusing on various attempts to address the problems of deforestation, particularly the rise of forest science, forest regulation, and state conservation. The processes of land-tenure change that Scott describes proved an excellent introduction to our first case studies from Asia, which showed how, with the deterioration of customary tenure systems, forest resources often lost their traditional protections from overuse.<sup>11</sup>

Readings by Tucker and Warren Dean on the misadventures of colonial foresters illustrated a key second stage of the process of deforestation: In an effort to slow the deterioration of forests that resulted from the deterioration of tenure systems, colonial powers called on a new generation of technically trained foresters who relied on forest science, quantification, and conservation laws.<sup>12</sup> As Tucker and Dean show, efforts by professional foresters to regulate forests rarely succeeded, even when they were undertaken with the best of intentions. These readings offered an excellent introduction to the rise of professional forestry, and students brought the insights of Harrison to their analyses of the successes and failures of forest science.

After examining deforestation and the attempts to stem the problems with regulation, protection, and science, we then turned to an alternative solution: tree planting. Ricardo Carrere and Larry Lohmann's book, *Pulping the South*, allowed us to connect historic reforestation attempts throughout the world with current shifts in world forest industries.<sup>13</sup> Before teaching this class, I hadn't realized how profound recent changes in the forest industry have been. In the past fifty years, As Carrere and Lohmann show, net deforestation in the temperate developed world has been close to zero, while nearly 555 million hectares in the southern hemisphere have been harvested. Increasing protections on forests in the northern hemisphere have been accompanied, not by a decrease in wood consumption, but by a shift toward the south. With this has come industry consolidation, loss of jobs, increase in chipping and pulping, intensive capital investments, and, most important for their argument, the ecological changes brought about by the massive planting of eucalyptus and *pinus radiata* plantations.

To most students, tree planting at first seems entirely a good thing, motivated by Arbor Day impulses. They soon came to agree with Carrere and Lohmann, who argue that "planting a tree, whether native or exotic, is in itself neither a positive or a negative process. It is the social and geographical structures within which that tree is planted which make it one or the other."<sup>14</sup> *Pulping the South* shows that reforestation has a complex history, growing from agro-forestry projects

composed largely of fruit-bearing species such as olives, palms, coffee, cocoa, and apples. Teak and eucalyptus began to be planted in the nineteenth century as a response to depletion of oak in Europe. Nevertheless, extensive industrial tree plantations are a twentieth-century invention, established as a result of over-exploitation of native forests for wood. Their justification was the discourse of environmentalism. Yet they developed out of what Carrere and Lohmann term forestry imperialism, not in response to local needs. Monocultures are a way of responding to problems brought about by the prevailing economic model without addressing underlying causes: rising demand, decreasing access, changing climate.

Carrere and Lohmann argue that “the problems modern forestry science sets and solves in short are those thrown up by a politics of centralized control of land aimed at extracting a very few types of raw material in industrial quantities. Working exclusively within mainstream forestry science means not asking questions about, and thus tacitly supporting, that politics. Forestry science is thus not a ‘neutral tool’ which can be detached from its social surrounding and adapted to any political purposes.”<sup>15</sup> While many of the students had at first resisted Scott’s emphasis on legibility and Harrison’s arguments about science, reading Carrere and Lohmann helped them understand the broader significance of those analyses.

We finished the semester with a set of readings that asked the students to consider whether forest history should engage with public policy. Should historians play a role in policy debates over proper management of public and private forests? Or would that lead to the intellectual problems obvious in *Strangely Like War*, where advocacy substituted for analysis?

To help answer these questions, we turned to the recent scholarship of Africanists: the political ecologists Melissa Leach and James Fairhead, and the environmental historians James McCann and Thaddeus Sunseri.<sup>16</sup> As these scholars show, conservationists have long argued that deforestation has run rampant throughout Africa, with grave impacts for biodiversity. Leach and Fairhead argue that West African forests are not nearly as degraded as often assumed, while McCann argues that much less of the Ethiopian highlands was forested in historical eras than conservationists and colonial powers believed.<sup>17</sup>

Flawed forest histories have had profound effects on African peoples. According to the Economic and Social Research Council, they

incorrectly stigmatised land users, and ignored how farmers have often been enriching and stably managing their landscapes; supported environmental policies which further impoverish an already poor people by taking resources from them and by diverting development funds from more pressing needs; misled regional and global climate modellers, undermining the credibility of their conclusions; fostered conflict by dangerously obscuring the historical experience of inhabitants, and the basis for their political and land claims. ... If the analysis is correct, then inhabitants of 20 million hectares of West Africa are being blamed for deforestation which they have not caused. Dr Melissa Leach said: “They have paid heavily for this in policies aimed to control their so-called environmental vandalism and to remove their control over resources in favour of national and international guardians.”<sup>18</sup>

In other words, forest history isn't just an academic exercise. Assumptions about forest history drive forest policy throughout the world. Whether you agree or disagree with the political ecologists' data, their work needs to be closely considered by forest historians.

Such forest histories also made students question some of their own convictions about recent American forest debates. It's easy, for example, for students to see injustices when African peasants are deprived of customary access to forest resources, but harder to see the same processes at work in the United States today. Comparative forest history makes students more willing to consider the perspectives of people living in timber-dependent communities close to home.

When students pondered local forest debates with the perspective they gained from the international community forestry literature, they were able to see connections between local issues and economic forces affecting forests across the globe. Enormous changes are happening in world forestry. Increased fiber production, the shift of industry to the south, the devolution of forest control from centralized states to local communities, the increased preservation of northern lands accompanied by increased deforestation in southern lands—all have the potential to transform not just forests, but also the local communities that directly depend on those forests, and the global community as well.

Social and community foresters in the developing world have begun to challenge the colonial ideology of traditional forestry still taught in most institutions. Throughout the world, many local communities are coming to the realization that technical forestry hasn't worked for them. Observing forest history on the ground has convinced them that instead of protecting forests, as it was meant to do, technical forestry all too often led to a dramatic deterioration of forests. In the face of challenges to their technical expertise, many foresters have retreated into ever more intensive quantification, believing that the failures have come about because of a lack of correct numbers, rather than because of the overall orientation of forest science.

Yet forestry is asking itself tough questions, and historians can help them. For example, part of my academic position at the University of Wisconsin is as a faculty member in the Social Forestry group in the Department of Forest Ecology and Management. I serve on the long-term planning committee, which is evaluating the ways we train students and hire new faculty. Not surprisingly, while we all know the profession of forestry is rapidly changing, we're having a difficult time figuring out what that means for the curriculum. We know that purely technical training won't serve our graduates well, since most foresters today spend more time moderating human conflicts than measuring trees. But trying to agree on changes to the curriculum runs into the usual problem: No one wants to add new topics if that means dropping old topics. Forest scientists object that it takes more and more time to teach an increasing load of technical material, and "there's no time to teach all that social stuff!"

Foresters cling to their technical expertise, feeling it lies at the core of what forestry is all about, yet not understanding that it also has been at the core of forestry's historic problems. Foresters are often completely bewildered that local communities resent them. "We're here to protect your forests!" foresters insist,

hurt that locals distrust them. If foresters were more aware of the contentious history of professional forestry and the dispossession of local access to common property resources that often accompanied forestry around the globe, they might be more understanding of local resistance. Knowing some history might keep foresters from feeling blindsided by current controversies.

How can world forest history become more interesting? I argue that it needs to become more engaged—with community forestry, with forest policy, and with scholars in other disciplines. Ecologists have taken a great deal of interest in forest history, and landscape ecologists in particular have been doing innovative and exciting work at the boundaries between ecology and history. Much of this work engages directly with conservation and forest-policy debates. World forest historians can contribute to this debate by collaborating with political ecologists and landscape ecologists, in much the same way that Heasley's work with Guries, and David Foster's work with John Aber, is enriching debates over forest management within the United States.<sup>19</sup>

The literature on forest land tenure systems, on political ecology, and on forest policy is inherently historical, and it could benefit from closer links to forest history. Perhaps it is time for forest history to move beyond individual case studies, get over its uneasiness with theory and social science, and engage in closer dialogue with community forestry, political ecology, and landscape ecology. Forest history would be the richer for it, and the human and ecological communities that depend on forests might eventually benefit as well.

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## NOTES

1. Michael Williams, *Deforesting the Earth: From Prehistory to Global Crisis* (Chicago: University of Chicago Press, 2002).
2. Derrick Jensen and George Draffan, *Strangely Like War: The Global Assault on Forests* (White River Junction, Vt.: Chelsea Green, 2003).
3. Emily Russell, *People and the Land through Time: Linking Ecology and History* (New Haven: Yale University Press, 1998); and David R. Foster, "Conservation Lessons and Challenges from Ecological History," *Forest History Today* (Fall 2000): 2-11.
4. James C. Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven: Yale University Press, 1999).
5. For an analysis of the ecological simplification that has resulted from traditional forestry, see Nancy Langston, *Forest Dreams, Forest Nightmares: The Paradox of Old Growth in the Inland West* (Seattle: University of Washington Press, 1995).
6. Lynne Heasley and Raymond P. Guries, "Forest Tenure and Cultural Landscapes: Environmental Histories in the Kickapoo Valley," in *Who Owns America? Social Conflict Over Property Rights*, ed. Harvey M. Jacobs (Madison: University of Wisconsin Press, 1998). Heasley and Guries's work provides an exception to the generalization that

environmental historians have tended not to pay much attention to land tenure. Their fine-scaled analysis examines the complicated ways that changes in land ownership have led to changes in forest composition.

7. International Institute for Environment and Development, "Land Tenure and Resource Access in West Africa: Issues and Opportunities for the Next Twenty Five Years," (London: IIED, 1999) 2, <http://www.iied.org/drylands/pubs/execsumm/7396.html> (Accessed 21 December 2004).
8. Scott, *Seeing Like a State*, 76-77.
9. Richard Tucker, *Insatiable Appetite: The United States and the Ecological Degradation of the Tropical World* (Berkeley and Los Angeles: University of California Press, 2000).
10. Robert Pogue Harrison, *Forests: The Shadow of Civilization* (Chicago: University of Chicago Press, 1993).
11. For an entry into this extensive literature, we used David Edmunds and Eva Wollenberg, "Historical Perspectives on Forest Policy Change in Asia: An Introduction," *Environmental History* 6 (April 2001): 190-212; and Ramachandra Guha, "The Prehistory of Community Forestry in India," *Environmental History* 6 (April 2001): 213-38.
12. Tucker, *Insatiable Appetite*; Warren Dean, *With Broadax and Firebrand: The Destruction of the Brazilian Atlantic Forest* (Berkeley and Los Angeles: University of California Press, 1997).
13. Ricardo Carrere and Larry Lohmann, *Pulping the South: Industrial Tree Plantations and the World Paper Economy* (London: Zed Books, 1996).
14. *Ibid.*, 10.
15. *Ibid.*, 11.
16. James C. McCann, "The Plow and the Forest: Narratives of Deforestation in Ethiopia, 1840-1992," *Environmental History* 2 (April 1997): 138-59; Thaddeus Sunseri, "Reinterpreting a Colonial Rebellion: Forestry and Social Control in German East Africa, 1874-1915," *Environmental History* 8 (July 2003): 431-51; James Fairhead and Melissa Leach, *Reframing Deforestation: Global Analysis and Local Realities—Studies in West Africa* (London: Routledge, 1998).
17. James Fairhead and Melissa Leach write: "Forest loss has been systematically exaggerated in each country in West Africa—in total it is around 10 million hectares, not the usually cited 28 million. This has happened both by vastly overestimating the area where forest 'used to exist', and by considering forest lost in earlier centuries to have been lost recently. Forest cover in 1900 may have been more than that in 1700, following depopulation associated with slavery and colonial wars in Liberia, Ghana, and Cote d'Ivoire. The area capable of supporting forest has increased in recent centuries due to climatic improvement, but has varied up and down during deep climatic changes in historical times. Many of today's forests cover areas which were previously savanna, and may exist because of people, not despite them. The vegetation forms supposed to be the least-disturbed or most 'natural' are in fact often the most disturbed, testifying to the capacity of people to enrich soils and vegetation." Press release issued by the Global Environmental Change Programme Office of the Economic and Social Research Council, UK, 24 June 1998; available online at <http://www.sussex.ac.uk/Units/gec/pubs/pressrel/prforest.htm>.
18. *Ibid.* James Fairhead and Melissa Leach's work, not surprisingly, has proven controversial, and many ecologists question their data and results.
19. Heasley and Guries, "Forest Tenure and Cultural Landscapes"; and David R. Foster and John D. Aber, *Forests in Time: The Environmental Consequences of 1,000 Years of Change in New England* (New Haven: Yale University Press, 2004). In a forthcoming essay, Heasley argues that when environmental historians collaborate with scientists, the insights they gain about landscape change can allow them to tell better human histories. See Lynne Heasley, "Shifting Boundaries on a Wisconsin Landscape: Can GIS Help Historians Tell a Complicated Story?" in press, *Human Ecology*.