

Commentary

ECO-JUSTICE

The following papers were presented at the ESA 2006 Annual Meeting in Memphis, Tennessee, at the Symposium: Linking Ecology and Environmental Justice.

ESA and Environmental Justice

Ecologists' interest in environmental justice (EJ) issues has spurred increasing consideration about the relationship between EJ and ecology. Over the past several years, ecologists have sponsored symposia, roundtables, and discussions at ESA Annual Meetings. In 2000, speakers included G. Middendorf on ESA's relationship to environmental justice, N. Targ on EPA's role in environmental justice, J. Cubit on ecology in court to serve environmental justice, and C. Hopkins on black is green: a baseline study of environmental programs at historically black colleges and universities.

In 2002, G. Middendorf and B. Grant discussed ecology, environmental history, environmental justice, and the role of ecologists in society; C. Nilon spoke about the North City Sustainable Communities Project: linking research, restoration, and community involvement, T. Woiwode addressed The GreenWays Initiative: building the community of southeast Michigan; R. Tohannie, T. Alcoze, A. Moote, and S. Oran asked, who speaks for the mycorrhizae? environmental justice in Southwest forest restoration; J. Bonet outlined challenges and rewards of multilingual outreach; M. Floyd and C. Outley talked about children's perceptions of neighborhood risks: an environmental justice perspective; N. Cole showed how climate change threatens the most vulnerable; and L. Jablonski and T. Poling discussed Environmental Justice and religious movements—restoring engagement in the world.

In August 2006, George Middendorf, Charles Nilon, and Leanne Jablonski convened a symposium, Linking Ecology and Environmental Justice, in which nine presentations delineated specific links between ecology and EJ. Each speaker was asked to examine links between his or her research, teaching, and life as an ecologist with environmental justice issues, needs, and opportunities. As you will see in the presentations included in this issue of the *ESA Bulletin*, each has done so in a different manner. While each is, obviously, consistent with the speaker's own history and interpretation of how these two disciplines might link, the results, although individually unique, reveal that each speaker thought it critical to establish links between ecology and environmental justice—and that the development of strong links was critical to the future of both areas.

In this symposium, Steward Pickett, Mary Cadenasso, and Chris Boone discussed “The ecology of environmental justice: relationships to ecological theory; John Vandermeer and Ivette Perfecto related “Tropical conser-

vation and grass roots social movements;” Doug Boucher spoke about “The exploitation of natural resources and the people who extract them”; Hank Howe, in his talk, “Is curiosity good for anybody?,” considered how society and societal values affect ecological research; Ann Bartuska and Lynne Westphal talked about “Restoring justice/restoring ecosystems: the intersection of ecology and environmental justice.” Marie Miranda, Joe Aldy, and Bill Schlesinger’s discussion of “Resistance and resilience as frameworks for understanding the justice implications of global climate change” is not included in this issue of the *ESA Bulletin*, as they decided to submit it elsewhere. Kristin Shrader-Frechette addressed the often confusing “and/or” issue of “Saving nonhuman species, killing humans”; and Leanne Jablonski and Para Poling discussed the specific role of ESA in EJ in their talk, “Environmental justice and ecology: developing the ESA agenda.”

We believe that each of the talks presented in this issue of the *ESA Bulletin* is interesting, useful, and ultimately, transformative.

Defining environmental justice and the role of ecology

In the early 1980s, EJ activist efforts focused on the disproportionate siting of waste dumps in minority communities. Increased recognition of environmental disparities led to the development of EJ from the civil rights movement, with historical antecedents in the social work and feminist movements of the early 20th century. EJ passed through several earlier incarnations: environmental racism and environmental equity. EJ differs from these in that EJ is defined by its recognition that

- 1) disparate and disproportionate environmental impacts occur among different communities across racial and socio-economic lines,
- 2) affected communities should be apprised of environmental issues affecting them, and
- 3) these communities should be incorporated in any decision-making process.

Of the three components, the first and third, recognition and inclusion, are probably best addressed through political and social venues, and it was to that end that President Clinton mandated in Executive Order 12898

To the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review, each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations....

The effectiveness and success of this order remains problematic—and a topic for discussion in another venue.

The second component is the one where application of ecology appears most fruitful and critical as this component concerns the use and role of science—and it is this aspect that was the focus of this symposium. Historically, early EJ efforts centered on health-related issues and their causes, e.g., waste sites, pollutants, and the like. Thus, the relationship of science and EJ has largely centered on assessing differential environmental impacts on communities and developing associated models of risk, costs, and benefits. Science for EJ has been concentrated in sociological, health, and economic studies. What remains to be integrated into this are the natural sciences, particularly ecology.

While this seems a reasonably simple and straightforward task, there are several barriers that make it difficult.

First, historical connections between EJ and ecology are lacking. The largely white ecological community is quite different from the mostly minority EJ community (which, in the United States, includes African American, Hispanic American and Native American proponents and practitioners, but also economically disadvantaged white populations like Appalachia). Because ecologists are academically located in the natural sciences and EJ practitioners mostly come from the social and health sciences, it has been difficult to cross disciplinary boundaries. The focus differs as well; ecologists examine broad, general processes, while EJ practitioners focus on specific situations. Because of these community, disciplinary, and historical differences, individuals active in ecology and EJ have often (perhaps almost always) not interacted with one another. It is our belief that not only need this not be so, but that each will benefit greatly from the other. Natural science and ecology are critical for assessment of environmental impacts on communities and for developing models to examine the risks, costs, and benefits associated with environmental public policy. On the other hand, EJ is critical in providing focus and support for ecologists and ecological studies. That they are not exclusive is best exemplified by the work of two professors of urban planning. Corburn (2002, 2005) articulates an environmental approach that combines community-based research with local environmental knowledge to deal with asthma and subsistence-fishing hazards. Such an approach could either be combined with ecological studies of nutrient cycles, or used as a basis for future ecological studies. Spirn's (2000, 2005) long-term studies of the Mill Creek neighborhood in Philadelphia stand out as an exemplar of the role ecology should play in environmental planning.

But just how linked (or unlinked) are Ecology and EJ? A survey of the Web of Science from January to June 2006 using "environmental justice" as keywords revealed 1078 results appearing in 41 publications, only one of which might be considered peripheral by most ecologists, *Ecological Economics*. A keyword search in Amazon and Barnes and Noble web sites using "environmental justice" for books published between January and July 2006 revealed 22 books, of which only three could be thought ecologically orientated, Burke's *Focus on Ecology* (an edited volume), Gore's *An Inconvenient Truth* (to accompany the movie of the same name), and Gleik's *The World's Water 2006–2007* (a biennial report on freshwater resources). EJ is a research focus of a number of fields, but rarely for traditional ecologists. EJ is seen in anthropology, sociology, chemical, civil, and environmental engineering, history, law, library and information science, medicine, nursing, public health, etc, but not ecology. We conclude that there really isn't much linkage between the two.

EJ has been viewed by ecologists, and others (see Foreman 1998, for instance), as either advocacy or as an inappropriate research topic—probably because of its origin as a grassroots environmental movement among communities of color. Several misconceptions and preconceptions have acted toward this end.

Reframing ecology—and EJ

One misconception has been how we, as scientists, narrowly define and view research. Traditionally, we have framed research as basic, where science is conducted for its own sake or as applied when conducted either for or as the result of policy. Only occasionally do we recognize a hybrid approach in which basic and applied research are combined by extending a basic research framework into the human domain. This last approach is increasingly important in addressing critical scientific issues (those defined by individuals and communities outside the academy), gaining public support for research, and providing information to the public for use in the policy process. Incorporation of EJ into ecology represents a method that would not only increase integration of ecology into the resolution of critical environmental issues, but also create new funding opportunities for ecologists, expand interest in the field of ecology among members of underrepresented groups, and involve residents of local communi-

ties in environmental research and decision making. Each of these fulfills the goals and mission of the ESA.

One preconception is that because EJ has relied on sociology and economics, it does not need ecology. This is not surprising given the roles of science generally outlined in the EJ literature, which suggests that science is important in:

1) Evaluation of risk, cost, and benefits, usually associated with chemical and toxic exposures within and across communities. The particular exposures or specific issues have not often included ecology as a factor affecting exposure level. This is either due to the lack of ecologists doing EJ, or to the fact that ecologists are generally unaware of or insensitive to EJ issues, perhaps because they do not live in affected communities or are uncomfortable in dealing with the communities involved.

2) Evaluation of combined and synergistic exposure impacts within a context of individual communities. Ecologists are not trained for this.

3) Assignment of specific risk levels, costs, and benefits to impacted, potentially impacted, and other communities. Ecologists are often unaware of the need for this and certainly are not trained in the sociological, economic, and health dimensions of such problems.

4) Providing information to affected communities and decision-makers in a reasoned and unbiased manner. If ecologists are not involved in Nos. 1–3, they are most unlikely to be involved with No. 4.

Clearly, if ecology is to have a relationship with EJ, ecologists must begin by delineating the very role of ecology in EJ.

We believe that an understanding of ecology and ecological principles is critical in understanding and dealing with EJ issues. For instance, the top 10 key ecological concepts identified by BES members (Cherrett 1989) were (in rank order): the ecosystem, succession, energy flow, conservation, competition, niche, materials cycling, the community, life history patterns, and ecosystem fragility. Similarly, the ESA web page notes that members conduct research, teach, and use ecological science to address environmental issues that include: biotechnology, ecological restoration, ecosystem management, habitat alteration and destruction, natural resource management, ozone depletion and climate change, species extinction and loss of biological diversity, and sustainable ecological systems. A quick look at some of these areas will illustrate possible links between ecology and EJ.

Biotechnology

As food production becomes increasingly split among industrial, organic, and local approaches, the ability of different communities to absorb environmental impacts and afford costs is becoming increasingly differentiated.

Ecological restoration

Because of historical decisions, much ecological work is needed for environmental restoration in cities and in poor and minority communities.

Ecosystem management

Knowledge of sources, reservoirs, sinks, flow, and drivers would be useful in understanding and predicting

environmental impacts, particularly for EJ pollution issues.

Habitat alteration and destruction

Perhaps the most ecologically devastating natural disaster in recent times has resulted in numerous publications, most of which, like “In the Wake of the Storm: Environment, Disaster, and Race After Katrina” include professors affiliated with the disciplines of economics, Latin American and Latino Studies, sociology, and environmental studies/community health, but not ecology. An understanding of the role of ecology in land subsidence, wave impact, and loss of shoreline, to cite but a few examples, is so critical that its absence all but assures incomplete and incorrect solutions.

Ozone depletion and climate change

As Nancy Cole pointed out (2002), people of color and poverty tend to live downhill and downstream—and will be among those most affected by rising water levels—as was so clearly seen last August in New Orleans. They, and the very young and very old, are also the least able to afford and tolerate extreme temperatures.

Species extinction and loss of biological diversity

It should go without saying that biodiversity is affected by poverty and development. Thus, conservation plans must provide alternatives to harvesting of animals for bushmeat and the pet trade industry. Further, the impact of people is expected to increase in latent risk hot spots (Cardillo 2006).

Natural resource management

The recent debates (see for instance, Shellenberger and Nordhaus’ (2004) “The death of environmentalism,” Foreman’s (2006) “Take back the conservation movement,” and McCauley’s (2006) “Selling out on nature” as examples) focus on differences between conservationism, preservationism, and environmentalism—all within the context of their relation to humans, the built environment, resource needs and methods of extraction. While we cannot solve the differences, we can make a case that an understanding of fundamental ecological principles are critical for bridging the chasms and perhaps resolving some of these differences. (See for instance the UNEP Green Cities Declaration (2005) which resolves “...to build an ecologically sustainable, economically dynamic, and socially equitable future...”)

Sustainable ecological systems

With Adams et al. (2004) recognizing that “the creation of protected areas can have substantial negative impacts on local people,” one cannot but envision difficulties in establishing successful and sustainable protected areas absent consideration of the surrounding human communities.

One of us was asked recently whether EJ isn’t just another form of applied ecology. Indeed, it probably is, or certainly a case could be made for this—and that isn’t necessarily bad. The recent ESA Visions Report (2004) noted that “ecological knowledge must underpin the decisions that affect ecological sustainability ... at all levels of society worldwide.” Turner (1996) pointed out that “If an ecosystem can’t be known or controlled with scientific data, then why don’t we can all the talk of ecosystem health and integrity and admit, honestly, that it’s just public policy, not science.” We don’t believe that it’s all about public policy, but do contend that without

consideration of the public in developing policy, we are not likely to achieve any reasonable long-term success. Environmental justice is one framework that not only looks promising, but is the right thing to do. Keep in mind that while scientists identify, develop, and provide solutions to problems, implementation of these involves the public and politics.

Acknowledgments

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