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Could a public ecology approach help resolve the mountaintop mining controversy?

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ABSTRACT

In recent years, controversy has grown around decisions related to mountaintop removal mining of coal in Central Appalachia, USA. While this mining method can be particularly efficient, it necessitates removal and relocation of huge volumes of earth—permanently altering the natural landform and potentially impacting local environments and communities. Current decision-making systems and regulatory frameworks have been largely ineffective at incorporating the values and concerns of stakeholders. This is due, in part, to contradicting policies, a legacy of distrust, and problems related to scale. Further, the lack of good civic science related to mountaintop mining and meaningful routes for public involvement have also hampered effective decision-making. We propose that the fundamental concepts of *public ecology* may provide a progressive approach to resolving these complex issues, and examine the challenges that must be met along the way.

Introduction

The American public became acquainted with the growing controversy over mountaintop mining in the late 1990's when the issue began appearing in mainstream media. An article by Loeb (1997) appeared in the U.S. News and World Report that introduced the general public to the growing controversy over mountaintop [removal] mining of coal in Appalachia . While the mining method has been practiced for over 30 years in the region, its increasing footprint against the backdrop of national and global energy challenges has sparked much debate and tension between numerous entities, including members of the coal mining industry, federal and state agencies and courts, labor unions, environmental and community advocacy groups, land holding companies, private citizens, and researchers from both the public and private sectors and academia. As demands for inexpensive, domestic energy compete with those for sustainable development, alternative decision-making systems – perhaps one based in *public ecology* – are clearly needed to approach and resolve the issues surrounding mountaintop coal mining (Robertson and Hull, 2001, 2003a; Luke, 2003).

The objectives of this article are to: (1) provide an overview of mountaintop coal mining in Appalachia and the current decision-making systems for related issues; (2) describe an alternative system based in the theory and practice of public ecology; (3) discuss the major challenges to actually applying public ecology to mountaintop mining issues in Appalachia, and some preliminary attempts to overcome these challenges; and (4) highlight the lingering questions that must be answered in order to move forward with a public ecology approach.

Mountaintop mining in Appalachia

The coalfields of central Appalachia, specifically those in southwestern Virginia, southern West Virginia and eastern

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Kentucky, are rich in high thermal efficiency, low-impurity (e.g., sulfur) material. This coal has long served as a major energy resource for the U.S., and current projections show that both national (Energy Information Administration, 2012) and global (Waddell and Pruitt, 2005) demands for it will continue for the coming decades. Additionally, the central Appalachian coalfields contain metallurgical coal resources, which have high values on world markets. Central Appalachia accounts for approximately one-fifth of annual U.S. coal production, particularly because of its proximity of the utility markets of the U.S. eastern seaboard (Energy Information Administration, 2012). The U.S. Environmental Protection Agency (2011a) (EPA) estimates surface coal mines have affected 480,000 ha (1.2 million acres) or 10% of Central Appalachia . While the area is predominantly rural, the population of the central Appalachian area where mountaintop mining may occur was approximately 2 million in 2010 (U.S. Census Bureau, 2012).

Methodology and potential impacts

Coal can be mined by either surface or underground methods, depending on the location, size and quality of the deposit, surrounding geology, and often a multitude of environmental, political and/or social factors. In central Appalachia, where numerous shallow coals seams can be relatively thin, mountaintop mining has become popular. With this method, all of the overburden (i.e., overlying rock and soil) is excavated to expose the coal, which can then be nearly completely recovered. While some overburden material can be replaced on the mined mountaintop, much of it is deposited in adjacent valleys via a practice termed "valley filling." Moving such massive volumes of overburden can only be justified economically by high quantities and qualities of coal, like those that exist in Appalachia; and ownership of large tracts of land by holding companies has provided many mountaintop mining operations an "efficiency of scale." For example, in West Virginia, some operations can remove over a dozen seams of coal from properties that extend over thousands of acres (Environmental Protection Agency (EPA), 2005). A full discussion of mountaintop mining and its impacts can be found in the Programmatic Environmental Impact Statement on mountaintop mining and valley fills issued by five state and federal agencies (Environmental Protection Agency (EPA), 2005).

Despite its relative simplicity and high coal recoveries, mountaintop mining has become very controversial due to a variety of real or potential impacts on the mined land and surrounding environments and communities. Aside from the permanent alteration of natural landforms, significant impacts on ecosystems (e.g., habitat alteration or elimination) and water or air resources (e.g., decreased quality) might be caused by deforestation of mountaintop mining sites, chemical drainage from crushed overburden, and valley filling. With proper reclamation, many of these impacts can be mitigated or eventually reversed, but some may persist. Additionally, like for other types of mining, socioeconomic impacts of the production cycle on local communities are of concern for mountaintop mining operations.

Even with improved environmental management strategies and increasing emphasis on corporate responsibility at modern operations, "legacy" sites, which have not benefited from the most progressive and current best-practices, have drawn much public attention and fueled public distrust of both the mining industry and the regulatory agencies. Moreover, the sheer size of even the most modern operations, combined with the larger controversy over coal-derived energy, makes even a temporary footprint unacceptable to some who oppose mountaintop mining.

The current decision-making systems

Decisions about mountaintop coal mining in the U.S. are primarily made via a well-established, and continuously evolving Federal and state regulatory framework. Like other surface mining methods, mountaintop removal is governed by the Surface Mining Control and Reclamation Act of 1977 (SMCRA or the Surface Mining Act) (30 U.S.C 1201 et seq.), which is implemented by the Office of Surface Mining Reclamation and Enforcement (OSM)—a bureau within the U.S. Department of the Interior. The Surface Mining Act provides that states may take on the primary role for regulation under the concept of "primacy." If a state has primacy, which requires that their regulations and law are "no less effective than" the Federal regulatory program, then the role of the federal government becomes one of oversight of the state, rather than regulation of particular mining properties or companies. The regulatory program established under SMCRA is designed to protect the public and the environment from the detrimental effects of coal mining and reclamation operations.

In addition to the state-implemented Surface Mining Act requirements, mining operations are governed by the regulatory programs under other environmental laws, including the Clean Water Act (33 U.S.C. 1251 et seq.) and the Endangered Species Act of 1973 (16 U.S.C 1531 et seq.). Section 404 of the Clean Water Act, which is implemented by both the U.S. Army Corps of Engineers and the EPA, covers filling streams (i.e., as may occur with valley filling). State water quality agencies also have a role in regulation of the water impacts of coal mining operations.

Although the current regulatory framework has been conceived to address numerous environmental, and to a lesser extent social issues, the mining industry has seen a rapid movement towards internal regulation and responsible decision-making. An international consortium of industry produced a treatise on sustainability in the minerals industry that serves as a basis for many mining companies' corporate environmental and community engagement strategies (International Institute for Environment and Development and World Business Council for Sustainable Development, 2002). These companies have corporate sustainable development policies in place that provide guidance for many aspects of operations, and some provide voluntary annual reports on their contributions to sustainability. The U.S. coal industry is generally also very active in the World Coal Association (2012) and its efforts related to sustainability .Though development of both government- and industry-led decision-making systems has undoubtedly provided impetus for more sustainable mining practices, including those used in mountaintop mining, there are two major problems with the current state of affairs. First, these decision-making systems are largely independent of one another and do not always share a common basis. And second, neither system has been inherently designed to require broad public involvement. The emergence of *public ecology* offers a more integrated approach, which necessarily requires cooperation amongst all interested parties.

Public ecology and decision-making

Public ecology can be defined as the nexus of science, engineering, public policy and interest, citizen views and values, market forces, and environmental protection statutes and regulations, which, through an open and participatory discourse, is intended to ensure that the ecological systems continue to function as societies operate within and derive benefits from them. According to Luke (2001), "(p)ublic ecology should mix the insights of life science, physical science, social science, applied humanities and public policy into a cohesive, conceptual whole." And Robertson