The Relationship of Place Re-Making and Watershed Group Participation in Appalachia

Heather A. Lukacs [a] & Nicole M. Ardoin [b]

[a] Emmett Interdisciplinary Program in Environment and Resources , Stanford University , Stanford , California , USA

[b] Graduate School of Education and Woods Institute for the Environment , Stanford University , Stanford , California , USA
Published online: 12 Nov 2013.

PLEASE SCROLL DOWN FOR ARTICLE

Routledge
Taylor & Francis Group

The Relationship of Place Re-Making and Watershed Group Participation in Appalachia

HEATHER A. LUKACS

Emmett Interdisciplinary Program in Environment and Resources, Stanford University, Stanford, California, USA

NICOLE M. ARDOIN

Graduate School of Education and Woods Institute for the Environment, Stanford University, Stanford, California, USA

This article explores how participation in watershed groups creates a social space that mediates the relationship between biophysical places and place-protective action. We analyze qualitative data from a survey of more than 200 watershed group volunteers in the Appalachian region of the United States who were asked to describe experiences that encouraged or discouraged their participation. "Place" emerged as a key theme, with further delineations between made places (those highly affected by human activity, including coal extraction); natural places; and re-made places (those restored by the efforts of the watershed-group participants). Our findings suggest that the places themselves—and the natural, institutional, and social resources in these places—are more than a backdrop or setting for the volunteer activities; they also inspire, enhance, and are transformed by the act of volunteering.

Keywords Appalachia, participation, resource dependence, sense of place, volunteerism, watershed group

Orange water seeps from the mountainside, staining rocks and partially clogging a system built to prevent coal-mine drainage from destroying creek life. An outside observer might think this is a toxic waste site, yet to those who restore streams in coal-affected areas, this acid mine drainage (AMD) treatment system would be a visible indicator of a community group's success. Residents raised funds to build the treatment system, and because of their efforts, trout once again live in the stream. The system is only one example of how Appalachian residents in the United States have worked individually and collectively to restore places damaged by more than

100 years of coal mining-related activities. Volunteers working to restore these sites describe their watersheds as places of beauty and possibility. In this article, we explore how the social space created by participating in a watershed group mediates an individual's place-protective action that is restoring—and, in essence, re-making—places, such as this one. We also discuss how the opportunity for involvement provided by watershed groups sparks and sustains residents' place-protective action.

Named after a chain of mountains in the eastern United States, Appalachia extends from southern New York to northern Mississippi, as defined by the Appalachian Regional Commission, a federal–state partnership dedicated to alleviating poverty in this area rich in mineral resources (Glasmeier 2002). Appalachian residents living near coal extraction sites experience firsthand the health impacts of air and water pollution (e.g., Zullig and Hendryx 2011; Hendryx et al. 2008). Clean water and surface mining regulation do not prevent the persistent pollution threatening many of those who live near coal mines in Appalachia (Palmer et al. 2010); thus, the hard work of remediation is often left to local residents with limited financial resources who are willing to collaborate to improve their waterways. Watershed groups provide a structure for public participation in environmental planning and management and may serve substantive, pragmatic, and democratic goals (Larson and Lach 2008).

Although the benefits of citizen participation in watershed management are numerous, recruiting and sustaining participants is a persistent challenge for watershed groups (Parker et al. 2009; Koehler and Koontz 2008; Byron and Curtis 2002). Byron and Curtis (2002) found that low personal accomplishment within the group leads to high levels of burnout and attrition. In Appalachia, an additional impediment includes active marketing by the coal industry of a pro-coal economic identity that encourages an allegiance in conflict with an environmental ethos (Bell and York 2010). Some environmental-group participants have even reported receiving death threats because of their activism (Barry 2008).

Despite barriers, environmentally related civic engagement organizations—such as watershed groups—seem to be increasing in influence, visibility, and membership in Appalachia. To explore these trends and more closely consider the relationship between place and participation, we studied motivations for volunteering with watershed groups in Appalachia. By focusing on a particular natural-resource-dependent region and participant experiences in place-based watershed groups, our study contributes to research at the intersection of sense of place and action (e.g., Ardoin 2009; Vaske and Kobrin 2001), conservation volunteering (e.g., Liarakou et al. 2011), and watershed-group participation (e.g., Floress et al. 2011; Koehler and Koontz 2008).

Sense of Place and Place-Protective Action

Our research is situated in the place literature, which considers people–place relationships from multidisciplinary perspectives. Sense of place, a multidimensional construct comprised of biophysical, sociocultural, political–economic, and psychological aspects (Ardoin et al. 2012), provides a framework for considering how one's sense of place may relate to participation. Stedman (2003) emphasizes the physical environment and landscape attributes as more than just a setting where social interactions occur, but also as the basis for place meanings relating to place attachment

and satisfaction. Gieryn (2000) characterizes places by their geographic location, material form, and meanings, which motivate or demotivate collective action.

Strong place attachment, a related psychometric measure often operationalized into place dependence and identity constructs (Williams and Vaske 2003), has been associated with opposition to proposed/hypothetical place changes (Bonaiuto et al. 2002; Vorkinn and Riese 2001). However, past studies in rural, urban, natural, and built environments have suggested that the relationship between place attachment and place-protective action is not consistently positive, causal, or direct (Lewicka 2011). Studies suggest that the place attachment/action connection is mediated by social factors, such as individual trust (Payton et al. 2005), neighborhood ties (Lewicka 2005), and perceptions of proposed place changes by a dominant social group (Devine-Wright and Howes 2010). Place scholars disagree on the relative importance of social and physical aspects of place (Trentleman 2009) in mediating place-protective behaviors, as well as on how the attachment/action relationship should be studied, in part because of the epistemological and ontological differences among place research traditions (Patterson and Williams 2005).

Watershed-Group Participation

Few studies in the environmental and watershed volunteering literature explicitly consider place-related factors as potential motivators of individual participation. Most studies focus, instead, on individual and group-related factors, limiting study of place-related factors to volunteers' residential proximity to the volunteer location or broad rural/urban classifications (e.g., Koehler and Koontz 2008). Gooch (2003) took a more integrated approach to a study of catchment volunteers in Australia, where sense of place emerged as one key theme describing volunteer attachment to specific volunteer locations. Other studies of motivations for environmental volunteerism (e.g., Liarakou et al. 2011; Measham and Barnett 2008; Bruyere and Rappe 2007) in vastly different settings (e.g., Greece, Australia, and Colorado, respectively) suggest cross-cutting themes—such as learning, social opportunities, and connection to nature—that are likely attributable, in part, to where groups are geographically situated and the relationships among volunteers, the organizing groups, and these places.

In the case of volunteering for an environmental or watershed group, prior research confirms that biophysical and social motivations are intertwined: Volunteering for restoration activities is motivated by visible environmental improvements, teaching and learning about the natural world (Guiney and Oberhauser 2009), and the friendships volunteers build or deepen (Ryan et al. 2001; Gooch 2003). Strong social ties within a group are associated with more frequent and prolonged involvement (McDougle et al. 2011; Donald 1997). The greater the commitment of the volunteer, the more satisfaction the volunteer reports with respect to restoration projects, and, in general, with his or her own life (Miles et al. 1998). The Millennium Ecosystem Assessment (2005) framework draws additional connections between ecosystem services and human well-being. In the case of watershed groups, both the process (e.g., positive social interaction) and the outcomes (e.g., water quality improvements) enhance volunteers' well-being. Past research, however, does not speak to how different place-related factors (e.g., degraded landscapes, high poverty, or protected areas) may affect volunteer motivation and participation.

Appalachian Context

Characterized by non-renewable resource extraction and persistent poverty (Glasmeier 2002), the Appalachian context has the potential to powerfully affect how and why people participate in watershed groups. Coal has had vast ecological (Palmer et al. 2010), community (Bell 2009), and health (Zullig and Hendryx 2011) impacts in Appalachia—where more than 3 million people, including 38% of all West Virginia residents, live within 1 mile of an abandoned mine land (AML) site designated as high priority in its ''threat to health, safety, and general welfare of people'' (U.S. Department of the Interior 2003). Studies have focused on the disengagement and victimization of Appalachian residents because of these contextual factors (Gaventa 1980), which may ''manifest as latent social discontent'' and complacency (Gordon et al. 2010). Yet Appalachian residents also are often characterized as possessing deep place attachments (e.g., Rowles 1983; Stewart 1996) and an identity difficult for outsiders to understand.

This Appalachian context provides an opportunity to examine the interplay of place attachment, participation in collaborative efforts, and motivations for volunteerism in groups seeking to restore and protect rivers and streams. To this end, we undertook a study to explore how and why residents of Appalachia were motivated to participate in watershed groups. By studying watershed-group participation in a resource-dependent place, we draw attention to the tangible and malleable aspects of places as motivators of place-protective action.

Research Approach

We focused on watershed-group volunteers restoring and protecting rivers and streams within a subsection of Appalachia stretching from northeastern Pennsylvania to northern Tennessee (Figure 1). Following the watershed literature, watershed groups in our study are predominantly citizen-led (e.g., Moore and Koontz 2003) action collaboratives (e.g., Margerum 2008) that produce change through direct action, such as hands-on restoration activities. We triangulated our survey data with in-depth interview and observational data, supported by 3 years of field experience living in Appalachia. Watershed-group volunteers provided periodic reviews of early versions of findings.

Through purposive sampling, we selected 13 groups that met at least once a month, had ongoing projects or programs, and were located near AMLs at the time of data collection. Projects undertaken by these groups included, but were not limited to, educational displays at festivals; stream and road cleanups; advocating for basic wastewater services; and fundraising for, and supervising of, multimillion-dollar mine pollution remediation projects.

Data Collection

In this article, we report data derived from open-ended questions on a written survey completed by active volunteers in the 13 watershed groups. We administered the survey in partnership with the Appalachian Coal Country Watershed Team—a non-partisan, nonprofit organization based in Beckley, WV. We selected three of the watershed groups for in-depth observation; selection criteria included proximity to the watershed team and location in southern West Virginia.

Figure 1. Approximate location of watershed groups in this study with Appalachia as delineated by the Appalachian Regional Commission (2008).

In advance of visiting the 13 sites to conduct the written survey, we asked the leaders of each watershed group for a list of all ''active volunteers,'' defined as individuals who had volunteered with the group at least twice during the past year for at least two hours each time. We presented the lists of active volunteers to additional watershed group board members for corrections and additions and compared the lists with event sign-in sheets and meeting minutes, when available. Of the 345 surveys distributed in person,[1] 262 (76%) were completed. We asked each survey respondent to describe his or her participation in the watershed group over the last year. We excluded 31 surveys from analysis because of missing data or respondent inactivity over the past year. This process yielded a final sample of 231 surveys (67%).

Survey Instrument

Our survey instrument incorporated commonly used proxies for place attachment, including length of residence and home ownership (Lewicka 2011). We asked respondents to ''describe a particular experience that has encouraged or discouraged your participation in this watershed group'' and asked, ''What was your reason for beginning to participate in this group?'' Because the items inquired about an experience rather than a place, the ways in which places were evoked in descriptions emerged as the primary theme reported in this article.

Analysis

We analyzed responses to those open-ended survey items by coding the qualitative data in NVivo 8 without a priori categorization of themes. Because of its prevalence,

"mentioned places" became an early code category. In addition to recognizing the scale and specificity of places (in the tradition of Low and Altman 1992), we first grouped respondents' place descriptions according to material form, or what Gieryn (2000) calls the "physicality" of a place—for example, whether those places were "natural," highly affected, or "made" by those external to the watershed group, or "re-made" by watershed groups themselves. We theorized the material form as a manifestation of the biophysical dimension of place (Ardoin et al. 2012)—that which is tangible and can be viewed on a map or in a photograph. We later extended the category of re-made places—those that would not exist in the same form without the watershed group's efforts—beyond the biophysical objects, such as treatment systems or reclaimed lands, to also include places that facilitate "social" and "activity" categories, or the social space of the watershed group. Thus, iteratively, we developed families of emergent coding categories for our data. Our fieldwork also affirmed the importance of places and their material form as motivators for volunteers.

Findings

Overall, we found that watershed group volunteers had multifaceted relationships with "made" and "natural" places, and that these person–place relationships were powerful motivators in encouraging participation in watershed groups. The process of participating, in turn, engaged volunteers in a social space through which they had the opportunity to re-make the places affected by coal mining and other destructive activities. Both the social space and the biophysical re-made places were found to facilitate collaborative place-protective action, and to alter elements of the participants' sense of place (Figure 2). The data were further categorized to illustrate ways in which places and social spaces relate to place-protective action. Although we did not specifically explore place meanings, re-made places suggest that an investment with meaning and value through personal, group, and cultural processes makes a place more than a space (Low and Altman 1992).

   We present findings about place/participation connections in Appalachian watershed groups by their material form (see Table 1), or the physicality of place "whether built or just come upon, artificial or natural, streets and doors or rocks and trees" (Gieryn, 2000, 465). Our analysis suggests that the material form of the place is important to understanding place-protective action—or *why* people volunteer depends on the *what* of the place that motivates, and is transformed by, volunteering. We then present findings that suggest the social spaces co-created by watershed group members facilitate, and are a result of, place-protective action.

Figure 2. Places motivate participation, and participation re-makes places.

Table 1. Places mentioned by watershed-group volunteers when describing experiences

"Made" places	"Natural" places	"Re-made" places
Trash	Tributaries to the New River	Knapps Meadow Restoration Site
Straight pipes	Little Beaver Creek	Summerlee treatment
Septic systems	Borth Fork	Lime dosers
Local hospital	Mill Run watershed	Atwood Access Boat Launch
People's homes and property	Geology of our area	GCWA 5K Race
Raw sewers	Our local streams	Carpfest
Old McDonald Mine	Headwaters of this watershed	Bear Creek Festival
Strip-mined areas	Mouth where George's Creek empties into the Potomac River	Adopt-a-Lake Project
Mountain-top removal		Acid mine drainage projects
Local flooding		Completed projects
Open dumps in the county	Southeastern Kentucky streams	Rain-garden projects
Local water supply		Engineering projects

Made Places

Watershed group volunteers frequently reported that the specific, pressing, and visible environmental threats of "made places" encouraged initial or sustained involvement with the watershed group. Volunteers described places that were developed, constructed, or created directly through human influence. Experience of environmental threats in these places fell into two categories: (1) sudden, visible, and punctuating events, versus (2) slow, constant changes of chronic pollution, which pose a perceptual challenge that has been described as the "shifting baseline" (Pauly 1995).

Punctuating Events

Respondents describe punctuating events, such as a mine blowout,[2] pollutant spills, and repeated floods, using both generic and specific place names. In southern West Virginia, 79% of respondents in one watershed group and 57% in another reported flooding as one of their "top three water issues of concern." One volunteer, who has resided in the community for more than 40 years, was motivated to join the watershed group when "Mullens had devastating floodings in July 2001 and there was an urgency to do something to improve our rivers." A volunteer for the same group reported being personally affected by the 2001 flood because it "further devastated the economy with local businesses shutting down and residents moving out."

In a Kentucky watershed group, many volunteers were motivated to become involved when a diesel fuel spill contaminated the local drinking water supply. A mother of three children explained, "Many people in Eolia have to buy drinking and cooking water. The spill killed everything in the creek." She reported that her family recently switched from a household well to city water "because the well water was becoming unfit because of the mining. The city water is not always drinkable, and I know they don't let the public know soon enough in most cases." She is not alone in her concern over the diesel spill. More than 20% of the respondents from

this group mentioned this spill, and more than half became involved in the group to monitor water and/or to learn about "what is actually in the water," as written by one volunteer.

Chronic Pollution

In contrast to the sudden, punctuating events that demand immediate attention, volunteers reported being motivated by the challenges of dealing with chronic pollution, such as mining pollution and sewage being "straight-piped" directly from households into the creek with no treatment. For example, during an in-person conversation, one watershed group leader pointed to acid mine drainage (AMD) seeping from an old mine out of the side of the mountain and said, "You know there's an oil spill in the Gulf and it's been shut off. Ours flows every day." A 30-year-old respondent started participating after returning to his community "to take ownership in dealing with our water quality issues [after] experiences growing up dealing with straight-pipe problems and water quality issues related to coal mining."

In the case of chronic pollution motivating action, often it is the person's perception of the pollution that changes, rather than the pollution itself. Almost 65 of 225 (29%) survey respondents reported participating in water quality sampling efforts; becoming aware of poor water quality further prompted their involvement in watershed groups. One volunteer, for example, was motivated to participate after "seeing the monitoring results from the river, i.e., how much *E. coli* is present in the water."

Natural Places

When describing experiences that were particularly motivating, survey respondents named a range of places we categorized as "natural" (in contrast to "human-built"),[3] including proper names, and also general types of places (e.g., hollows, creeks, rivers, watersheds, and headwaters). In some cases, enjoyment and appreciation of the natural place motivated participation. One volunteer, employed in rail-trail park management, said her participation was motivated by "a beautiful day on the neighboring rail-trail (cycling and birding) that made me wish for the best of health for the creek." For another volunteer and avid fisherman, it was the experience of "finding native brook trout in the headwaters of this watershed" that encouraged his continued involvement with the group.

Several volunteers in the study were also motivated by the possibility of restoring natural elements of places that they perceive to be degraded. One college student volunteer expressed this sentiment: "When trying to fish on Decker's Creek, there are not fish in the stream to fish for. So, I want to help in any way I can to ... put those fish back on the map." An avid river guide and kayaker described the motivation for his involvement as being his love of hiking and camping near streams. He was also motivated by his desire "to see southeastern Kentucky streams cleaned up." In these cases, the respondents specifically mention biophysical places: a creek, the larger waterway, the fish, and other aquatic species. The respondents focus not on what has been degraded, but rather on what is possible.

Re-Made Places

Data analysis also revealed several types of places that would not have existed in the same way or occurred without the efforts of a watershed group. We labeled this

category "re-made places," which include visible results and social spaces that invest places with new meanings and value.

Visible Results: Environmental Outcomes
Our results show that it is not only motivating to anticipate or hope for restoration, but it is also encouraging to those already volunteering and those not yet involved to see restoration projects, environmental outcomes, and broad evidence of group progress. One watershed group in our study physically moved an entire stream away from a deadly AMD seep and built a treatment system consisting of a series of limestone beds for the contaminated water to run through before being discharged into the stream. This treatment system helped restore three types of trout to the creek, acting as a powerful and visible reminder of the group's effectiveness. Although most re-made places mentioned in the research results do not involve activities as dramatic as moving an entire stream, the places' material form can be altered as volunteers assist in building a new sewer system, picking up trash, or removing metals from the water.

One volunteer, who is also a fisherman, emphasized the visible positive change that motivates him when he discussed "how much the creek has changed. Before the watershed [group] got started, it was orange and yuck looking. As we keep it clean, the water now has fish." A retiree whose grandchildren also volunteer for the group said, "The cleanup of the creek and hollow was wonderful. It looks so much cleaner." And an educator in West Virginia who sees tourism potential in his watershed felt motivated by "our work on the metal drive—we have removed 350 tons of debris from open [trash] dumps in the county."

Many projects, however, require time to address long-standing pollution. A leader from a Pennsylvania watershed group, who first attended a watershed group event in 1998, puts into perspective the effort needed to address coal mine pollution: "The results of implementing some of the group's AMD remediation projects appear to be making a noticeable improvement to the water quality of a watershed that has been polluted for almost 200 years." In many Appalachian watersheds, there is little memory of the "natural" state of these waterways, as they have been degraded for generations. Thus, one of the challenges faced by watershed groups is maintaining group members' motivation when visible results are slow and pollution persists at large spatial scales.

Visible Results: Specific Projects and Activities
Places that emerged as "re-made" by watershed groups also include project sites and events. Hands-on, process-oriented activities (e.g., tree planting and stream cleanups) were frequently mentioned as encouraging participation. Others mentioned particular volunteer sites along with the activity, including one volunteer who also works for a state department of fisheries, who noted "tree planting at Knapps Meadow Restoration Site" as a motivating experience. Many of the re-made places described by respondents were actual projects or treatment systems (e.g., Lime doser, Summerlee treatment), indicating that physical structure is evidence of progress, although environmental benefits may not yet be realized.

Social Spaces
Watershed groups have created a new social space, with tangible and intangible dimensions. Of the 231 volunteers in our survey, 64% report attending watershed

group meetings and 66% report volunteering at events that provide social inter-action. The social space provides an opportunity to be around inspiring people, feel appreciated, and encourage the next generation to learn and grow through commun-ity engagement.

Volunteers reported that shared values among group members and the opportunity to interact with a community of like-minded people encourage their participation. One respondent explained: "Seeing others who also care about our community, the local environment, etc. It's a moving affirmaion of my own small efforts." Some volunteers were encouraged by others whom they perceived as being more involved, such as the "board and staff with a passion and focus for what they are trying to accomplish." Some respondents focused on shared values for steward-ship, in general: "Being with people who actually care about the land." Others highlighted shared values for a particular place or region: "Most people in the group want to improve the quality of life in Southern W[est] V[irginia]."

The social space provides an opportunity for group members to acknowledge the contributions of others. One respondent, who is deeply involved with the group, commented, "They are thankful for my input at each monthly meeting." Being thanked encouraged another respondent: "[A specific watershed group member] thanked me for having written to a legislator, and several members thanked me for organizing an evaluation of some engineering projects completed in the watershed."

For some volunteers, it was not necessarily the personal experience with volun-teering that was most motivating, but rather the experience provided for others in the shared social space. With more than 25% of the watershed group volunteers in our sample working in education-related professions, this result is not surprising. One volunteer reported being encouraged by the "impact my students have felt from participation in water-quality monitoring." This echoes motivations discussed by Measham and Barnett (2008) and is what Falk (2009) calls the "facilitator" role.

Discussion

Our data suggest that the physicality and material form of places matter for volunteer motivations, with the biophysical setting as a dynamic, motivating feature of place that entwines with the social space created by watershed groups to moti-vate place-protective action. These contextual factors are more than a container (Stedman 2003); the degraded landscapes of Appalachia inspire, enhance, and are transformed by the act of volunteering.

The "Why" and "What" of Volunteering

Our findings affirm that the broad categories of why people engage in volunteerism in Appalachia are similar to those in other places: Volunteers like to see the results of their work (Guiney and Oberhauser 2009), socialize with others with shared values (McDougle et al. 2011), learn about the environment (Liarakou et al. 2011; Ryan et al. 2001), and educate others (Measham and Barnett 2008).

Attuned to places that captured our respondents' attention, we added specificity and definition to the places themselves, or the "what" of place, that motivates action. The *what* of this natural resource-dependent place is just as important, if not more so, than the *why*. An example provided by one respondent speaks

powerfully to the motivation of this context: ''My pregnant wife drank water with diesel in it [before we knew of the contamination].'' Other poignant responses include references to the raw sewers that ''straight-pipe'' household waste directly into streams; the river that has been polluted for 200 years; the mine blowout that killed all stream life; the ''open dumps in the county''; and the pervasive threat of ''mountaintop removal.'' These chronic and acute threats foreground why people participate in watershed groups; they are the ''what'' of the place.

Scale, Specificity, and Tangibility of Places

Our findings suggest that among watershed volunteers in our sample, places of differing scale, specificity, and tangibility motivate people in different ways (see Table 1). For example, some people noted being motivated by a particular location on the creek or restoration site, while others had a broader affinity for ''our local streams'' or ''southern West Virginia.'' Places visited for the first time became more tangible to volunteers when, for example, they traveled to the end of the stream to collect water samples or they planted trees on abandoned mine sites. These intimate experiences changed perceptions of the difficulty of restoration of that particular place.

Our findings confirm research that emphasizes the importance of scale and specificity in an individual's relationship with a place (e.g., Cuba and Hummon 1993). Ardoin (2009) found that the scale where people hold the strongest place attachments is often the same scale at which they are most likely to engage in place-protective behavior.

Contextual Effects on Volunteering

In addition to the focus on the individual, the political–economic context is critical to exploring the person–place relationship (Ardoin et al. 2012; Manzo 2003). Natural resource-dependent areas (NRDAs), such as Appalachia, are defined as ''places where a natural resource either accounts for a substantial part of the local economy, or attracts population'' (Peluso et al. 1994). Poverty associated with NRDAs may be related to many factors, including resource degradation, limited state capacity to enforce regulations, increased capital mobility, and limited labor mobility resulting from the boom-and-bust cycle of the extraction economy and the power of private interests (Peluso et al. 1994).

Our findings suggest that these elements of NRDAs relate to watershed group participation in several ways, differentiating our study from others. First, the direct health and emotional burden of chronic and acute pollution is different when considering residents rather than recreational users or visitors. The example of the mine blowout that destroyed not only life in the stream but also the group's restoration work is a reminder that these communities are threatened daily, facing continuous challenges and large-scale pollution.

Second, these groups are distinct from many environmental justice groups because of their prolonged involvement in numerous and varied water-related issues. The persistent pollution means that the motivation and urgency for improving degraded conditions come from either considering different places or attaining new knowledge about their same places. Watershed groups help make chronic pollution visible to participants through their monitoring and education efforts. In

a place with limited state capacity to enforce regulations, watershed groups also often make pollution visible to regulators by providing water-quality data to initiate the watershed-based planning process required for government-fund eligibility.

Place Re-Making: Experience and Narratives

Despite many challenges, watershed group activities and the collective narrative created by group participants contribute to re-making places in Appalachia. The landscape changes that result from the groups' efforts offer a positive vision of local action, in contrast to the narrative of large-scale devastation related to resource extraction (Palmer et al. 2010), poverty (Glasmeier 2002), and powerlessness (Gaventa 1980). Watershed groups bring attention, and provide vocabulary for threats to place—many of which have been long-standing—thus adding a scientific lens and transparency to future place narratives that has been lacking in the past. Beyond the biophysical and social spaces, participation has the power to re-make the way people view their communities and their own sense of control within them, as evidenced by the shift from talking about what *they* have or have not done, to discussing how *we* are responsible for the trout in the creek, or that *we* re-made this place.

Our findings are consistent with research suggesting the importance of stories in place making (Basso 1996; Stokowski 2002). What residents formerly called "degraded" places, for example, they now refer to as "restoration projects" or "volunteer sites." Participants brought into general usage technical or less common terms, including watershed, habitat, and headwaters, as well as the names of particular water treatment technologies. As volunteers became more familiar with the types of pollution and possible solutions, they use more specific language, replacing, for example, the general term "mine waste" with the specific phrase "AMD."

Further, our findings indicate that social activities, such as participating in stream cleanups, contribute to a notion of place creation that is part of a positive and shared place narrative. Borer (2010) suggests that members of a stigmatized community have the ability to change the community's image by sharing positive place narratives with each other as well as with the outside world. In Borer's estimation, a neighborhood's "collective imagining is … as selective as their collective remembering" (2010, 107). Schultz et al. (2007) describe how social norms motivate environmental actions, noting that positive messaging describing change undertaken by social peers is more efficacious than negative messaging. Watershed groups in this study contribute to the collective imagination and social norms of those living in Appalachia.

Conclusion

This study builds on existing theory in the area of person–place relations and place-protective actions by focusing on residents in Appalachia (a natural-resource-dependent region) who exert agency to overcome barriers to group participation. Our emergent findings illuminate how the intertwined social, biophysical, and political–economic elements of place contribute to motivating and sustaining engagement. Although the visible outcomes of watershed group efforts may seem small relative to the massive impacts of coal and gas development in the region,

re-made places served as powerful symbols of local collective action to address pollution caused by others.

We contend that the biophysical context and its material form are critical in understanding motivations and demotivations for place-protective actions. An individual's experience of, and connection with, place can motivate participation in watershed groups. Negative motivators, such as place threats, as well as positive, visible indicators, such as seeing the effectiveness of a watershed group's efforts, can be equally motivating. Further, the act of re-making places, including the social space of the watershed group, can motivate participants to address place threats, working alongside others who care.

Related future research might explore "re-made" places as motivators for volunteers in other locations, thus furthering our understanding of citizen engagement facilitated by similar place- and community-based groups. Additionally, the language and place names provided by respondents may be useful in developing instruments to measure sense of place, place attachment, and associated variables that consider a range of scales and specificity of place with which volunteers connect. Our results also suggest that recruitment and retention of watershed volunteers may be enhanced by providing opportunities to observe and showcase the results of place re-making, such as visibly demonstrated projects in public spaces, community restoration events, and organized cleanup efforts, as well as augmented opportunities to learn about, and test for, pollution that directly affects volunteers and their families.

Through these targeted, visible avenues to place re-making, watershed collaboratives may effectively activate and connect with volunteers' desires to improve and enhance their places for themselves and their communities, both now and for generations to come.

Notes

1. Surveys were distributed at meetings or delivered to residences or offices.
2. A mine blowout occurs when pressure builds inside an underground mine, causing the mountain or hillside to suddenly break and release water and mine pollution into the stream or community below.
3. We recognize that human influence is difficult, if not impossible, to separate from ecological systems. However, while categorizing themes, we found it important to distinguish between human-built and non-human-built places.

References

Appalachian Regional Commission. 2008. *Map of the Appalachian Region.* http://www.arc.gov/appalachian_region/MapofAppalachia.asp (accessed 27 August 2013).

Ardoin, N. M. 2009. *Sense of place and environmental behavior at an ecoregional scale.* PhD dissertation, Yale University, New Haven, CT.

Ardoin, N. M., J. S. Schuh, and R. K. Gould. 2012. Exploring the dimensions of place: A confirmatory factor analysis of data from three ecoregional sites. *Environ. Educ. Res.* doi:10.1080/13504622. 2011.640930

Barry, J. M. 2008. "A small group of thoughtful, committed citizens": Women's activism, environmental justice, and the Coal River Mountain Watch. *Environ. Justice* 1(1):25–33.

Basso, K. H. 1996. *Wisdom sits in places: Landscape and language among the Western Apache.* Albuquerque, NM: University of New Mexico Press.

Bell, S. B. 2009. "There ain't no bond in town like there used to be": The destruction of social capital in the West Virginia coalfields. *Sociol. Forum* 24(3):631–657.

Bell, S. B., and R. York. 2010. Community economic identity: The coal industry and ideology construction in West Virginia. *Rural Sociol.* 75(1):111–143.

Bonaiuto, M., G. Carrus, H. Martorella, and M. Bonnes. 2002. Local identity processes and environmental attitudes in land use changes: The case of natural protected areas. *J. Econ. Psychol.* 23:631–653.

Borer, M. I. 2010. From collective memory to collective imagination: Time, place, and urban redevelopment. *Symbolic Interact.* 33(1):96–114.

Bruyere, B., and S. Rappe. 2007. Identifying the motivations of environmental volunteers. *J. Environ. Plan. Manage.* 50(4):503–516.

Byron, I., and A. Curtis. 2002. Maintaining volunteer commitment to local watershed initiatives. *Environ. Manage.* 30(1):59–67.

Cuba, L., and D. Hummon. 1993. A place to call home: Identification with dwelling, community, and region. *Sociol. Q.* 34(1):111–131.

Devine-Wright, P., and Y. Howes. 2010. Disruption to place attachment and the protection of restorative environments: A wind energy case study. *J. Environ. Psychol.* 30:271–280.

Donald, B. J. 1997. Fostering volunteerism in an environmental stewardship report on the task force to bring back the Don, Toronto, Canada. *J. Environ. Plan. Manage.* 40(4): 483–505.

Falk, J. 2009. *Identity and the museum visitor experience*. Walnut Creek, CA: Left Coast Press.

Floress, K., L. S. Prokopy, and S. B. Allred. 2011. It's who you know: Social capital, social networks, and watershed groups. *Society Nat. Resources* 24(9):871–886.

Gaventa, J. 1980. *Power and powerlessness: Quiescence and rebellion in an Appalachian Valley*. Urbana, IL: University of Illinois Press.

Gieryn, T. F. 2000. A space for place in sociology. *Annu. Rev. Sociol.* 26:463–96.

Glasmeier, A. K. 2002. One nation, pulling apart: The basis of persistent poverty in the USA. *Prog. Hum. Geogr.* 26(2):155–173.

Gooch, M. 2003. A sense of place: Ecological identity as a driver for catchment volunteering. *Austr. J. Volunteering* 8(2):23–33.

Gordon, J. S., R. C. Stedman, and A. E. Luloff. 2010. West Virginia wildland fire as latent social discontent. *Society Nat. Resources* 23(12):1230–1243.

Guiney, M. S., and K. S. Oberhauser. 2009. Conservation volunteers' connection to nature. *Ecopsychology* 1(4):187–197.

Hendryx, M., K. O'Donnell, and K. Horn. 2008. Lung cancer mortality is elevated in coal-mining areas of Appalachia. *Lung Cancer* 62:1–7.

Koehler, B., and T. M. Koontz. 2008. Citizen participation in collaborative watershed partnerships. *Environ. Manage.* 41:143–154.

Larson, K. L., and D. Lach. 2008. Participants and non-participants of place-based groups: An assessment of attitudes and implications for public participation in water resources management. *J. Environ. Manage.* 88:817–830.

Lewicka, M. 2011. Place attachment: How far have we come in the last 40 years? *J. Environ. Psychol.* 31(3):207–230.

Lewicka, M. 2005. Ways to make people active: The role of place attachment, cultural capital, and neighborhood ties. *J. Environ. Psychol.* 25:381–395.

Liarakou, G., E. Kostelou, and C. Gavrilakis. 2011. Environmental volunteers: Factors influencing their involvement in environmental action. *Environ. Educ. Res.* 17(5):1–23.

Low, S. M., and I. Altman. 1992. Place attachment: A conceptual inquiry. In *Place attachment*, ed. I. Altman and S. M. Low, 1–12. New York: Plenum Press.

Margerum, R. D. 2008. A typology of collaborative efforts in environmental management. *Environ. Manage.* 41:487–500.

Manzo, L. C. 2003. Beyond house and haven: Toward a revisioning of emotional relationships with places. *J. Environ. Psychol.* 23:47–61.

McDougle, L. M., I. Greenspan, and F. Handy. 2011. Generation green: Understanding the motivations and mechanisms influencing young adults' environmental volunteering. *Int. J. Nonprofit Voluntary Sector Market.* 16(4):325–341.

Measham, T. G., and G. B. Barnett. 2008. Environmental volunteering: Motivations, modes, and outcomes. *Austr. Geogr.* 39(4):537–552.

Miles, L., W. C. Sullivan, and F. E. Kuo. 1998. Ecological restoration volunteers: The benefits of participation. *Urban Ecosystems* 2(1):27–41.

Millennium Ecosystem Assessment. 2005. *Ecosystems and human well-being: Health synthesis.* Geneva, Switzerland: WHO Press.

Moore, E. A., and T. M. Koontz. 2003. A typology of collaborative watershed groups: Citizen-based, agency-based, and mixed partnerships. *Society Nat. Resources* 16: 451–460.

Palmer, M. A., E. S. Bernhardt, W. H. Schlesinger, K. N. Eshleman, E. Foufoula-Georgiou, M. S. Hendryx, A. D. Lemly, G. E. Likens, O. L. Loucks, M. E. Power, P. S. White, and P. R. Wilcock. 2010. Mountaintop mining consequences. *Science* 327:148–149.

Parker, J. S., R. Moore, and M. Weaver. 2009. Developing participatory models of watershed management in the Sugar Creek watershed (Ohio, USA). *Water Altern.* 2(1):82–100.

Patterson, M. E., and D. R. Williams. 2005. Maintaining research traditions on place: Diversity of thought and scientific progress. *J. Environ. Psychol.* 25(4):361–380.

Pauly, D. 1995. Anecdotes and the shifting baseline syndrome of fisheries. *Trends Ecol. Evolution* 10(10):430.

Payton, M. A., D. C. Fulton, and D. H. Anderson. 2005. Influence of place attachment and trust on civic action: A study at Sherburne National Wildlife Refuge. *Society Nat. Resources* 18:511–528.

Peluso, N. L., C. R. Humphrey, and L. P. Fortmann. 1994. The rock, the beach, and the tidal pool: People and poverty in natural resource-dependent areas. *Society Nat. Resources* 7:23–38.

Rowles, G. D. 1983. Place and personal identity in old age: Observations from Appalachia. *J. Environ. Psychol.* 3:299–313.

Ryan, R. L., R. Kaplan, and R. E. Grese. 2001. Predicting volunteer commitment in environmental stewardship programmes. *J. Environ. Plan. Manage.* 44(5):629–648.

Schultz, P. W., J. Nolan, R. Cialdini, N. Goldstein, and V. Griskevicius. 2007. The constructive, destructive, and reconstructive power of social norms. *Psychol. Sci.* 18:429–434.

Stedman, R. C. 2003. Is it really just a social construction?: The contribution of the physical environment to sense of place. *Society Nat. Resources* 16:671–685.

Stewart, K. C. 1996. An occupied place. In *Senses of place*, ed. S. Feld and K. H. Basso, 137–165. Santa Fe, NM: SAR Press.

Stowkowski, P. A. 2002. Languages of place and discourses of power: Constructing new senses of place. *J. Leisure Res.* 34(4):368–382.

Trentelman, C. K. 2009. Place attachment and community attachment: A primer grounded in the lived experience of a community sociologist. *Society Nat. Resources* 22:191–210.

U. S. Department of the Interior. 2003. *White paper on: People potentially at risk from Priority 1 & 2 AML hazards.* http://www.osmre.gov/resources/newsroom/News/ Archive/2003/050703b.pdf (accessed 27 August 2013).

Williams, D. R., and J. J. Vaske. 2003. The measurement of place attachment: Validity and generalizability of a psychometric approach. *For. Sci.* 49(6):830–840.

Vaske, J. J., and K. C. Kobrin. 2001. Place attachment and environmentally responsible behavior. *J. Environ. Educ.* 32(4):16–21.

Vorkinn, M., and H. Riese. 2001. Environmental concern in a local context: The significance of place attachment. *Environ. Behav.* 33:249–263.

Zullig, K. J., and M. Hendryx. 2011. Health-related quality of life among Central Appalachian residents in mountaintop mining counties. *Am. J. Public Health* 101(5):848–853.