

ABSTRACT

LONGEST, LANDEN. Social Control and Environmental Grievances in a Risk Society: Coal Ash Contamination in North Carolina. (Under the direction of Dr. Thomas Shriver.)

Extant research on the management of environmental threats in risk societies highlights the control that state actors and other elites exercise over environmental risk assessments. However, less is known about the particular mechanisms of social control used by elected and other state officials to manipulate citizens' interpretations of risk. I use the case of coal ash contamination in the Lake Norman region of North Carolina to analyze strategies of control aimed at discouraging residents from identifying possible links between contamination and illness. Drawing on a variety of data sources, including in-depth interviews (N=55) with area residents, I argue that these strategies of control have been central in fostering quiescence, or a lack of activism, in the affected communities. My findings demonstrate the success of social control mechanisms in forestalling collective community responses to environmental risks as well as the ways expert narratives of exposure influence the public's ability to identify environmental threats.

© Copyright 2021 by Landen Longest

All Rights Reserved

Social Control and Environmental Grievances in a Risk Society:
Coal Ash Contamination in North Carolina

by
Landen Longest

A thesis submitted to the Graduate Faculty of
North Carolina State University
in partial fulfillment of the
requirements for the Degree of
Master of Science

Sociology

Raleigh, North Carolina

2021

APPROVED BY:

April D. Fernandes

Sarah Bowen

Alison Adams
External Member

Thomas E. Shriver
Committee Chair

BIOGRAPHY

Landen Longest is a lifelong North Carolinian and a 2017 graduate of the University of North Carolina at Chapel Hill. She is currently a graduate student and teaching assistant in the Department of Sociology and Anthropology at North Carolina State University. Her research explores how communities and governments respond to cases of industrial contamination. Her primary research interests involve environmental health and illness, environmental risk, environmental social movements, and the social control of environmental grievances.

ACKNOWLEDGMENTS

I want to express my gratitude to Tom Shriver for his extraordinary mentorship, guidance, and support throughout my time as a graduate student. I am also thankful for the love and support of my husband Tim, my parents, and all of my wonderful siblings—Hollyn, Kathryn, Nickolay, Yui, Anju, Xiao, and Binny. Finally, I am grateful for the ever-present love of Eva, my best friend and canine companion.

TABLE OF CONTENTS

INTRODUCTION.....	1
CASE BACKGROUND.....	2
SOCIAL CONTROL IN A RISK SOCIETY.....	4
DATA AND ANALYTIC STRATEGY.....	9
SOCIAL CONTROL, RISK, AND QUIESCENCE IN LAKE NORMAN.....	11
<i>Establishing Authority and Expert Knowledge.....</i>	13
<i>Control of Information.....</i>	16
<i>Claiming Incomplete Science.....</i>	19
<i>Diversionsary Framing.....</i>	20
<i>Fueling Economic Anxieties.....</i>	22
<i>Stigmatization and Vilification.....</i>	23
CONCLUSION.....	25
REFERENCES.....	29

INTRODUCTION

Throughout the United States, thousands of communities have been faced with the challenge of responding to contamination resulting from the toxic by-products of polluting industries. Analysts have documented many cases in which communities were able to mobilize in response to these environmental threats and demand accountability from polluting corporations and complicit state actors. However, less attention has been paid to communities where collective action aimed at addressing environmental grievances has failed to emerge. Understanding the *lack* of activism in communities plagued by toxic contamination presents unique challenges, but an analysis of the factors contributing to quiescence, or the failure of aggrieved communities to organize in response to malfeasance, in the face of environmental risk can highlight important obstacles to communities in need of remediation.

I address this gap in the literature by analyzing the case of coal ash contamination and illness clusters in two towns in the Lake Norman region of North Carolina. In recent years, residents of Mooresville and Huntersville have raised concerns about elevated rates of thyroid cancer and ocular melanoma, suggesting that the towns' respective clusters of these illnesses are associated with exposure to coal ash from a nearby coal-burning power plant. Despite the existence of documented contamination and fairly consistent media coverage of the cancer clusters, an organized, sustained, and collective response has not emerged in response to these environmental health threats. In order to explain this lack of mobilization, I explore social control mechanisms employed by the state to prevent residents from challenging elite interpretations of the environmental risks posed by coal ash contamination.

The data from this project come from extended fieldwork conducted in the greater Lake Norman region over a 14-month period. I conducted 55 in-depth interviews with individuals

directly impacted by thyroid cancer and ocular melanoma, including cancer survivors and their family members, as well as individuals involved in the state's response to the illness clusters. Additional data come from analysis of newspaper data and government documents released by the state to address residents' concerns about coal ash contamination and health. My analyses of these data reveal that proactive measures of social control effectively stifled activism around residents' assessments of environmental health risks, as residents internalized the government narrative that remediation could not occur until a definitive link between contamination and the cancer clusters was established. Elites' use of silencing measures prevented individuals from translating their personal grievances into collective action, resulting in the continued dominance of the institutional assessment of risk asserting no link between coal ash and illness.

CASE BACKGROUND

Within the past six years, residents of two towns in the Lake Norman region of southwest North Carolina have raised alarms about elevated rates of cancer in their communities. In Huntersville, residents began to raise questions about a pattern that seemed too strange to be a coincidence after three former students of the same high school were diagnosed with ocular melanoma. Ocular melanoma typically afflicts only six in one million adults (Ocular Melanoma Foundation). However, since the town's first cases of ocular melanoma were discovered in 2014, two of the first three women diagnosed have died, and over 30 cases of the cancer have been identified. Ocular melanoma is a vicious cancer, killing 50 percent of those it afflicts within five years of metastasis (Kaliki, Shields and Shields 2015). And while the cancer typically affects men in their seventies, an alarming number of victims in Huntersville have been women in their teens and twenties.

In neighboring Mooresville, residents began to notice a similar pattern when a local mother raised questions about the number of thyroid cancer cases affecting her lakeside neighborhood. Although her daughter was otherwise healthy, she was diagnosed with thyroid cancer while still in high school. After discussing the diagnosis with her neighbors, the resident was shocked to find five cases of the cancer on her street alone. Determined to identify an underlying cause, this resident raised money to fund a study aimed at determining whether a cluster existed and, if so, whether the cancers were linked to an environmental factor. The consulting chemists' analysis determined that Mooresville's rate of thyroid cancer was three times the national average, with 191 diagnoses within a four-year period in a town of roughly 40,000 people (WCNC).

In the process of investigating both clusters, residents began to raise concerns that exposure to coal ash could be responsible for the prevalence of cancer in their communities. Duke Energy's coal-burning Marshall Steam Station neighbors Mooresville along Lake Norman. The power plant stores millions of tons of coal ash in unlined pits adjacent to the lake. Beginning in the 1980s, Duke Energy provided coal ash to local developers and landscapers to use as structural fill dirt. Today, many of Mooresville's largest developments and busiest thoroughfares rest on top of coal ash. As recently as September of 2020, a sinkhole erupted in a parking lot, exposing a fill site containing over 45,000 tons of the contaminant.

Research into the impact of coal ash on the environment and the body has demonstrated that the toxic elements contained in the by-product can have detrimental effects on human health (Ruhl et al. 2009). A recognized Group I human carcinogen "enriched in toxic metals and radioactivity," the particulate size of coal ash allows it to fly easily through the air and reach locations far from where it is originally produced (Ruhl et al. 2009). Current research suggests

associations between coal ash exposure and lung, bladder and skin cancers (Ruhl et al. 2009). However, Duke Energy maintains that the presence of coal ash in the Lake Norman region is unrelated to the area's cancer clusters. And while local governments have expressed a desire to identify the root cause underlying the clusters, residents have expressed frustration at local and state governments' hesitation to seriously consider the possibility of a link to an environmental contaminant.

SOCIAL CONTROL IN A RISK SOCIETY

Scholars have spent considerable time conceptualizing and theorizing the existence of environmental risks in modern society. The prevalence and severity of environmental risks have increased in tandem with technological innovation, modes of production, and sources of energy (Beck 1992; Elliott and Frickel 2013; Giddens 1990; Jameson 1991; Perrow 1999). The capitalist emphasis on ever-expanding production has led to a proliferation of natural resource extraction and refining and industrial processing at unprecedented rates, all of which are linked to risks of contamination, human exposures, and environmental disasters (Cable 2012; Cable et al. 2008; Lerner 2010; Perrow 1999). Ulrich Beck's (1992, 1996, 2006) risk society thesis posits that modernized societies are now characterized by the presence of such risks and the "power game[s]" involved in mediating them. According to Beck, the acceleration in technological production post-WWII has resulted in historically unprecedented levels of environmental risk (see also Cable 2012; Elliot and Frickel 2013; Mudu et al. 2014). Inherent to processes of modernization and industrialization, these risks are justified by elites who view them as necessary externalities of capital accumulation.

Because assessing the extent of these threats often involves highly technical information that may be inaccessible to the public, elite experts have a de facto monopoly on evaluating risk

(Mythen 2007; Freudenberg and Jones 1991; Jensen and Blok 2008; Kroll-Smith and Couch 1993). Without access to information about the risks accompanying production processes, the lay public is forced to look to experts to judge the extent and severity of imminent environmental risks (Beck 1992; Briggs 2006; McNew-Birren 2015; Sjöberg 1999). However, risk experts often have vested interests in concealing the realities of these dangers because they often exist in “[a symbiotic relationship with] corporate actors who seek ever-higher profits, and state actors who seek continued economic growth to maintain a nation’s wealth” (Cable et al. 2008:382). Experts often communicate risks in language characterized by uncertainty and ambiguity, as they are incentivized to obscure the extent of the risks polluting industries pose to human health (Frickle and Edwards 2014). This ambiguity is exacerbated by the complex and highly technical nature of expertise needed to understand modern sources of environmental risk (Beck 1992; Giddens 1991; Jensen and Blok 2008). As a result, experts frequently make policymaking decisions regarding environmental risks without meaningful public input.

While we know that risk experts, or “gatekeepers,” can have a vested interest in maintaining control over public knowledge of potential risks, questions remain about the specific mechanisms they can use to achieve this end. I argue that the literature on social control provides insight into this black box. In the study of social movements, scholars have explored how elites deploy mechanisms of social control to forestall activism (e.g., Earl 2003, 2004; Stockdill 1996; Tilly 1978). While violent forms of repression are more likely to garner headlines, more subtle non-violent mechanisms of control are more likely to prevent the formation of collective grievances.

The goal of social control is to maintain the status quo, and this can be achieved most effectively by the use of ideological power to manipulate the public’s perceptions of injustices

(Gaventa 1982; Roscigno et al. 2011; Turk 1982). Analysts have utilized the term *quiescence* to describe “the absence of collective activism in the face of deprivation or injustice, especially under conditions in which one might reasonably expect protest to occur” (Cable, Shriver, and Hastings 1999: 61; see also Shriver et al. 2014). Indeed, extant research on environmental grievances details how state action can cultivate quiescence even in cases of significant environmental health threats. Communities threatened with environmental risk are quiescent when they fail to mount collective resistance to polluting industries and their state allies (Cable 1999, Gaventa 1982).

Researchers have increasingly focused on understanding the underlying factors explaining cases where activism fails to materialize despite documented contamination and patterns of illness (Auyero and Swistun 2008; Lora-Wainwright 2017; Shriver et al. 2020). These analyses have highlighted how elites frame environmental risks as fundamentally ambiguous or intentionally withhold information and downplay concerns about exposures and illness (Beck 1992; Erikson 1994; Lerner 2010; Messer et al. 2012; Sjöberg 1999; Vyner 1988). Uncertainty about the nature and extent of contamination, exacerbated by elite control of scientific knowledge and expert assessments’ downplaying the danger of exposures, can also result in quiescent responses to environmental threats (Goldstein 2014; Shriver et al. 2020).

In order to understand the underlying mechanisms contributing to community quiescence in cases of widespread environmental contamination, analysts have described these measures in a variety of ways. *Proactive mechanisms* are aimed at preventing the emergence of grievances and focus on promoting the internalization of elites’ normative frames, whereas *reactive* or *coercive measures* are responses meant to limit the formation grievances and spread of collective action (Cable et al. 1999; Shriver et al. 2014). For example, in their analysis of a community blighted

by heavy metal contamination from a zinc smelter facility in Blackwell, Oklahoma, Shriver et al. (2014:277) developed a typology exploring how elite manipulation was used to maintain local quiescence in the face of environmental health threats. Their analysis revealed that proactive measures were taken in anticipation of protest with the goal of impeding residents' ability to translate their individual concerns into collective grievances. When proactive measures failed to deter the most concerned residents from speaking out, the government resorted to coercive measures of control in order to thwart existing calls for remediation and disincentive further mobilization.

The term *soft repression* describes the use of nonviolent, coercive methods of control, such as strategies of ridicule, stigma, and silencing, which can be deployed by elites to silence dissent (Ferree 2005; Jämte and Ellefsen 2020; Garcia 2014). Silencing, “a deliberate strategy of exclusion” of aggrieved perspectives in the public discourse, often presents as a lack of representation of movement views and activity in the popular media (Ferree 2005:148). In some circumstances, the presence of actual threats and intimidation is not necessary to forestall movement activity—the *perception* that engaging in activism could pose risks to physical safety can prevent the emergence of environmental social movements in the face of contamination (Shriver 2000). Soft repression is also used to prevent community mobilization around environmental concerns (Ferree 2005). In contaminated communities, diversionary framing that shifts blame to residents for their exposure to toxics is a key strategy used to preempt the emergence of collective action (Bain and Selfa 2013; Freudenburg and Alario 2007; Messer et al. 2012).

Communities affected by environmental illnesses demonstrate the consequences of living in a risk society. Illnesses resulting from toxic exposures are a prime example of the

consequences to the lay public that can result from risky technologies (Cable et al. 2008; Cable 2012). When industries contaminate communities with the toxic by-products of production, corporate and government actors often minimize the associated risk and environmental illnesses (Brown et al. 2003; Sjöberg 1999; Reich 2000; Messer et al. 2017). Acting as gatekeepers of critical information, experts make it difficult for residents to establish links between illness and exposure due to a lack of resources and technical expertise. Additionally, the length of time it often takes for the health impacts of toxic exposures to manifest can make establishing causality difficult (Beck 2006; McCormick 2012; Brown et al. 2006).

When victims of environmental illnesses attempt to mount challenges against contamination, officials and various other elite risk experts can draw from a broad repertoire of social control tactics. However, we know relatively little about the specific mechanisms these actors can utilize in order to foster silence and quiescence. I utilize the case of coal ash contamination in the greater Lake Norman region in North Carolina in order to investigate how state actors can deploy proactive measures to silence residents' environmental health grievances and compel the acceptance of elite assessments of environmental risk. I also analyze the soft forms of repression used to limit and contain individual grievances, thus forestalling the emergence of widespread environmental activism in the community. Specifically, I ask, how were state actors and other risk experts able to prevent Mooresville and Huntersville residents from developing and acting on their own assessments of the threats posed by coal ash contamination? What does the failure of these communities to challenge official interpretations of risk reveal about the suppression of environmental grievances in a risk society?

DATA AND ANALYTIC STRATEGY

The data for this project include interviews conducted with community residents, government documents, and newspaper coverage of ocular melanoma and thyroid cancer clusters in the greater Lake Norman region of North Carolina. I conducted 55 in-depth, semi-structured interviews with a diverse group of respondents who have been impacted by cancer and involved in responding to concerns over coal ash contamination. Interviews occurred both in-person and over the phone, with most interviews taking place remotely due to COVID-19-related safety restrictions. Data collection occurred over a period of fourteen months. The interviews ranged from fifty-five minutes to three hours long.

Initial contacts with participants were made through building on my existing network ties in the community. Once these initial contacts were established, I used snowball sampling to identify additional participants. Some participants were identified through the use of purposive sampling, in which case print and television news data was used to identify individuals who had been impacted by the cancer clusters or involved in addressing them. Interviews were conducted in two waves. The first wave of interviews consisted primarily of individuals who had been directly or indirectly impacted by cancers that are suspected to occur at elevated rates in the community. These respondents include survivors of thyroid cancer, ocular melanoma, and rare brain cancers; mothers, fathers and other relatives of cancer survivors; mothers of children who have died from cancer; and community activists. The second wave of interviews was largely made up of individuals who have been involved in government response to community concerns about elevated rates of cancer and associated environmental contamination. This group includes elected officials at the municipal, county and state levels; representatives of government

agencies; and researchers in epidemiology, ophthalmology and environmental sciences who have participated in governments' response to the cancer clusters.

The vast majority of participants (76%) were women. The skewed sex demographics of the sample reflect the disproportionate number of women diagnosed with thyroid cancer and ocular melanoma and women's disproportionate involvement in community activism and awareness-raising regarding the cancer clusters and coal ash contamination. Of the individuals who have spoken publicly on their concerns about the area's cancer rates and the ubiquity of coal ash in the region, most have been women, and many have been mothers of children afflicted with a cancer diagnosis. Additionally, almost all (93%) participants were white. The racial makeup of the sample is roughly in line with the racial constitution of the towns' populations. As of the 2010 U.S. Census, Huntersville and Mooresville were 88% and 81% white, respectively (US Census). And while the thyroid cancer cluster in particular has appeared to concentrate around some of Mooresville's wealthiest neighborhoods, participants spanned a wide range of occupations, including business executives, house cleaners, yoga instructors, attorneys, nurses, cosmetologists, and homemakers.

During interviews, I worked from two interview guides. The first guide included questions aimed at residents with direct or secondary experiences of illness. The second guide was developed for participants involved in government responses to the cancer clusters. While I used these guides to prompt discussions of key issues, I tried to give participants space to elaborate on the topics that most resonated with their experiences. Participants in the first wave of interviews were asked about their perceptions of environmental conditions in the area, governments' and the broader local community's response to the cluster and coal ash contamination, their degree of concern about exposure to coal ash and its connection to their

illness, and their illness experience. Questions in the second wave focused more on the participants' involvement in responding to the clusters and environmental contamination and on their perceptions of the effectiveness of local and state governments' responses. These participants were also asked their opinion on whether the area's elevated rates of cancer are associated with exposure to coal ash contamination.

Following the transcription of the interviews, I used line-by-line coding of the content to sort the data into groups of emergent themes. The organization of the data into documents sorted by codes and sub-codes allowed me to determine which themes were most central. In order to better analyze municipal, county and state governments' responses to residents' concerns about contamination and illness, I examined government documents published by elected officials and various government agencies aimed at addressing concerns and providing information to the public. These documents included a comprehensive timeline published by Iredell county outlining the government's response to residents' thyroid cancer concerns, the official report of the multidisciplinary Collaboratory commissioned by the state to investigate the clusters, and government responses to residents' most asked questions about cancer and contamination, among others. I also assessed newspaper data pertaining to the issue from outlets including *The Charlotte Observer*, *The Statesville Record & Landmark*, *The Mooresville Tribune*, and *The Hickory Daily Record*.

SOCIAL CONTROL, RISK, AND QUIESCENCE IN LAKE NORMAN

In the case of the greater Lake Norman region of North Carolina, findings indicate that municipal, county, and state governments engaged in a proactive campaign to prevent the public from coming to independent assessments of the risk of coal ash contamination, which some residents suspect underlies the area's elevated rates of cancer. I analyze how elite informational

gatekeepers engaged in six key strategies of control to promote quiescence in the Mooresville and Huntersville communities. These strategies—establishing authority and expert knowledge, controlling information, relying on narratives of incomplete science, promoting diversionary frames, fueling economic anxieties, and stigmatization and vilification—were all designed to promote the internalization of the government frame into residents’ conceptualizations of the region’s contamination and the resultant environmental health risks. While I analyze these mechanisms separately in order to clarify and distinguish the characteristics of the multiple strategies of control employed by the state, it is important to note that the process of deploying these mechanisms was iterative, rather than linear. The deployment of distinct mechanisms of control resulted in a dynamic interplay through which the use of one mechanism could reinforce the effectiveness of other strategies. The successful exercise of these tactics of suppression would ensure that experts sympathetic to state and corporate interests would be able to maintain their control over assessments of the risks resulting from coal ash contamination.

In order to maintain this monopoly on risk assessment, state actors developed a narrative that dismissed residents’ concerns about contamination and minimized the severity of the apparent problems. The government frame promoted by state actors in Mooresville and Huntersville relied on four key assertions. First, the state argued that there is insufficient evidence that coal ash is harmful to human health. Next, state actors asserted that there is not proof that the area’s rates of cancer are related to an environmental cause. The state also suggested that it is possible the area’s apparently elevated rates of cancer are actually due to measurement errors or coincidence and that the purported cancer clusters may not exist at all. Finally, elected and other government officials claimed that when it comes to taking action to

address coal ash contamination, the government's hands are tied until a direct causal link between coal ash and the two cancers is established.

Establishing authority and expert knowledge

In order to successfully promulgate the narrative that no action could be taken to remediate coal ash contamination until clear proof of a link between coal ash and thyroid cancer and ocular melanoma, local and state governments sought to establish themselves as legitimate authorities that residents could trust to guide the communities' responses to their concerns. While Duke Energy engaged in a public relations campaign denying that coal ash exposure was related to health risks, residents received most of their information regarding contamination from government actors. These officials engaged in two key methods of establishing authority: demonstrating alliances with scientific authorities and cultivating the appearance of an active investigation into the illnesses while providing little substantive information about contamination.

In order to convince residents that they were taking all possible steps to address the communities' health concerns, state actors capitalized on the public's "faith in science" by broadcasting local and state governments' collaboration with scientific authorities (see Cable et al. 1999). In this way, the state exploited the public's reliance on experts to evaluate environmental risks, as the government's use of experts controlled the information residents received about the level of risk associated with coal ash exposure. A key strategy to signal to residents that local government responses to the cancer clusters were scientifically sound—and therefore trustworthy—involved holding public community meetings at which "scientific experts" were invited to speak. These meetings were typically run by panels of experts and elected officials selected by local governments to address the public's concerns. Residents who

attended these meetings often reported that panel experts dismissed community concerns about coal ash contamination, suggesting that no existing scientific evidence can link coal ash exposure to the region's cancer rates. One resident, a survivor of a rare brain cancer who attended community meetings after he began to suspect that his own illness was related to coal ash contamination, remarked:

And [local elected official] ... during that meeting, he brought in this like 25-year-old epidemiologist. And the whole reason for her being there was basically to tell everybody that was there that there is no possible links to environmental conditions that could be . . . causing cancers. And I said, "No shit Sherman! I've heard that about a ten thousand times." Does that mean that we just ignore it? It was very infuriating.

Government officials also signaled scientific validity by conducting various genetic and environmental tests with the purported goal of identifying the underlying cause of the area's elevated cancer rates. In Mooresville, after community members started to question the safety of their water, local officials coordinated with environmental scientists at Virginia Tech to test water samples provided by residents. In Huntersville, the ophthalmologist directing the town's ocular melanoma investigation consulted with Columbia University to conduct genetic testing of ocular melanoma patients in order to determine whether the patients were genetically predisposed to developing the disease. Test results indicated that none of the patients had genetic factors that placed them at risk for developing ocular melanoma. In both cases, the local governments' collaboration with scientific experts was used to signal to residents that state efforts to respond to the cancer clusters were legitimate.

Another central tactic used by officials to maintain legitimacy involved holding public meetings to demonstrate to residents that local governments were actively addressing their concerns. Respondents repeatedly reported that there was little relevant information shared at the meetings. Concerned residents who attended government-led community meetings in both towns

frequently complained that they left the meetings, which were advertised to provide residents with answers about their health concerns, disappointed at the meetings' lack of substance. One ocular melanoma survivor remarked,

They've had several hearings where they talk about the subject, but they don't ever really talk about findings and research and different things that's been exposed in that area over time... It's always, "The scientist is doing this, and they're doing research here and still can't figure out what this phenomenon is." And I'm just like, I think it's kind of obvious. . . There's nothing that they're really covering. They're telling people, "Oh, there's a cancer cluster and more people got cancer," but there's nothing else being said or talked about or discussed.

Another respondent, who is a survivor of thyroid cancer, was similarly disappointed in the lack of information provided at a community meeting she attended:

There was no new information. There was no new updates . . . from anyone on the panel. It was more of the most recent update, which was nothing new yet. The chemists are supposed to speak to us, I think it's at the end of March again. They're going to come back and speak and give an update. There were no answers, no new answers.

Despite their failure to provide substantive information to residents regarding environmental health risks, state actors were eager to publicize their efforts to investigate the community's concerns. The county government overseeing Mooresville published a ten-page document detailing all measures the local government had taken to respond to community concerns about thyroid cancer. Elected officials spoke publicly about their advocacy on behalf of cancer victim in the community. The resulting narrative—that local governments were proactively investigating the cancer clusters and taking all possible measures to identify their causes—implied to residents that the state's handling of the issue was legitimate. The messaging to residents was clear: the state was doing everything possible to solve the puzzle, so advocacy on part of the residents was unnecessary. Additionally, the lack of information provided to

residents about the health risks of coal ash exposure ensured that residents would have to rely on the assessments provided by the government experts downplaying these risks.

Control of information

Another key proactive mechanism of control employed by government officials in the greater Lake Norman region involved controlling the information provided to residents regarding the cancer clusters, coal ash contamination, and the relationship between environmental exposures and health. By determining what information was broadcasted to residents, local governments were able to “set the terms” for public discourse around the risks posed by the region’s contamination. State actors in both communities primarily controlled residents’ access to information by controlling the public informational meetings held in response to community members’ concerns. Some participants criticized the local government for intentionally limiting the number of residents who could attend community meetings. A thyroid cancer survivor noted:

And part of the problem was that they waited until the last minute [to announce the meeting], I believe, so that people couldn't go... There was going to be a certain number of people that were going to be allowed. And once that number was hit, then you couldn't get in... And you had to RSVP, which was kind of weird. And then they had said that it was full. They wouldn't take any more. And then some people went, and some people left and then others went in to take their place. And they said that they didn't really learn anything [at the meeting].

Government officials also limited the ability of residents to attend informational meetings by holding them at inconvenient times. A Huntersville resident offered this illustrative question:

[W]hy make the town meetings in the morning where people that work can't attend? Why not make things at a time where everyone can attend, everyone can have a say? Why do they limit it so there is not that availability so that everyone can see what's going on? . . . I also work during the day, so there's no way that I can go during the day to one of these meetings.

Respondents also reported that government-sponsored panels tightly controlled topics of discussion at community meetings, refusing to allow residents to speak of environmental

concerns. As one participant observed at an informational meeting regarding Mooresville's elevated rates of thyroid cancer,

I felt like they weren't letting you ask questions. If you started talking about the coal ash, you were cut off quickly and they were like, "We're having another meeting. You can ask that question then." Cause there were a lot of people, there was a girl that was from Davidson that was a writer that had some great questions, and they would cut her off.

Another Mooresville resident echoed these concerns, noting, "When coal ash and [local environmental activist] got brought up [at the meeting] they shut off the Q and A. They shut it down. . . Nobody in government wants to talk about coal ash."

An additional tactic government officials used to control information was "information dripping," a strategy that involved periodically providing residents with small amounts of information in order to cultivate the appearance that local governments were doing all that they could to respond to concerns about contamination and illness. By releasing a constant stream of information related to the clusters and government actions in response to them, government officials hoped to assuage the public's concerns that the government was not doing enough to investigate the environmental roots of the area's elevated cancer rates. One elected official described the strategy this way:

I have this little saying that, so taking out reality and going into this world of politics, "If you're explaining, you're losing." And we're [elected officials] in the explaining position. So we can't combat all of these accusations with a concise, quick response because there isn't one. So that's where we just try to continually drip information- not drip, but get information as we receive it and make sure that we continue to communicate that across the board.

Some state actors also manipulated the information provided to residents about the cluster by engaging in *coordinated denials* of the environmental threats facing their communities.

Despite evidence validating the existence of elevated levels of thyroid cancer in Mooresville and elevated rates of ocular melanoma in the Huntersville area, a number of elected officials have

argued that these elevated rates *do not* constitute a cancer cluster. These coordinated denials exemplify how elites “manufacture consensus by ‘definitional fiat’” (Cable et al. 1999:62). If the state has the power to determine what qualifies as a cancer cluster, the state can counter claims of environmental illness by asserting that patterns of these illnesses do not exist in the first place. One local elected official remarked, “And I’m not even sure it really is a cancer cluster, but the fact that you’ve had that many [cases], it sort of gets labeled that way. Does it meet all the criteria [for a cancer cluster] long term? I’m not even sure it does.” A scientist involved in researching possible environmental causes of the region’s elevated rates of thyroid cancer pointed out,

DHHS does not want to use the word “cluster.” And when I asked them specifically, the response was, “We don’t find it helpful and it impacts people’s property values.” So they were resistant to using that term. And so while I understand the word cluster can lead to a lot of fear and concern, it’s the definition, right? It’s how CDC defines it. There’s a guideline, there’s a paper, everything that was generated, all the data was generated is in alignment with the definition by the CDC for cluster, which is why I used it.

In perhaps the most blatant denial of the environmental risks associated with coal ash exposure, one local elected official organized a meeting aimed at helping realtors learn how to effectively sell homes to potential out-of-town buyers who might be deterred by publicity around the region’s cancer clusters. The tagline of the digital poster advertising the event, “Coal Ash & Thyroid Cancer: Update with Facts, Not Fake News” suggested that narratives diverging from the government’s institutional frame of the issue constituted “fake news” that should be disregarded. The digital poster featured the logo of the Town of Mooresville, leading some residents to criticize the town government for sponsoring an event that discredited the claims of concerned citizens.

Claiming incomplete science

In addition to controlling the information available to residents, local governments sought to promote quiescence by *relying on narratives of incomplete science* which suggest that action cannot be taken to remediate the harms of contamination until a definitive causal link between coal ash and the relevant cancers is established. The assertion that proof is needed before action can be taken is significant because it reinforces the power of risk experts to determine the appropriate course of action. Those experts with the authority to establish such “proof” are frequently incentivized to downplay the need for remediation that would threaten the economic interests of the state and polluting industries. Respondents routinely reported that rather than seriously consider the possibility that exposure to coal ash posed health risks to community members, elected officials and other government actors—including researchers aiding in government investigations into the clusters—claimed that coal ash was likely unrelated to the region’s cancer rates. One resident, whose aunt died of ocular melanoma years after working at Marshall Steam Station, Duke Energy’s coal-burning power plant alongside Lake Norman, described her experience attending a public meeting about the ocular melanoma cluster, “[There was an] eye doctor who was basically telling what he knew of the studies, basically what he knew of the studies so far. He didn't think it had anything to do with the coal ash.”

A local elected official argued that the lack of scientific consensus around how to interpret Mooresville’s apparently elevated rates of thyroid cancer raised doubt about the existence of a cluster at all, stating:

Because even among the smartest in the bunch, they disagree on how to interpret [the data], how to statistically analyze what [cancer rates are] higher than normal. . . I mean, there are some of the statisticians in that group that were arguing that this increase is really not a quote “increase.” It is just old statistical models trying to average out something for a shifting population. . . I mean, is there really, truly

a higher rate of thyroid cancer? I don't know. . . . I mean, some of these epidemiologists kind of think that it's all a numbers game.

Government actors relied on this mechanism to abnegate responsibility for taking action in response to residents' environmental health concerns. Until scientists are able to establish "proof" that coal ash caused Lake Norman area residents' cancers, policymakers have claimed, their hands are tied. The government frame's fixation on the need for "proof" of a direct, causal relationship between coal ash exposure and thyroid cancer or ocular melanoma is reflected in many interviews with residents, suggesting that community members have internalized this institutional frame. When asked whether she believed her local government was doing enough to address residents' concerns about contamination, one participant was unsure, saying,

I guess it's kind of hard to say at the moment since they [the local government] don't know the cause behind it. I mean, I do feel like there could be more that should be done, but at the same time, like I said, we don't know a 'for sure' cause. So it's hard to say whether they're doing enough.

Diversionsary framing

Another proactive mechanism of control employed by the state with the goal of suppressing the communities' environmental grievances was diversionsary framing, or offering alternate explanations for the region's elevated rates of cancer without implicating coal ash (Freudenberg and Alario 2007). If residents accepted these alternate narratives, the state's assessments of the risks of contamination would be more likely to go unchallenged. Some local elected officials made public assertions that other factors, particularly the use of cell phones or makeup products, might be responsible for residents' illnesses. One elected official suggested that residents who claim coal ash caused their illness could be making a dangerous assumption, explaining:

So that assumption that coal ash causes thyroid cancer is dangerous . . . because one, we don't have proof, and two, what happens if it's eye makeup or a cell

phone, or some other contaminant that we have? So now we've picked a fight with the largest regulated monopoly and then also we didn't have our facts right. . .

A concerned Mooresville resident expressed frustration at elected officials' claims that the use of makeup or cell phones could be responsible for the region's elevated cancer rates:

Why would we even mention in a public setting it could be makeup and cell phone towers or cell phones or power lines, when me and you as a general citizen [are] going, "Well, men don't typically wear makeup." I mean, typically. So why would men be getting testicular, pancreatic, brain cancers? Why did I go to the funeral of a young boy who went to Lake Norman High School, Brawley Middle School, and got leukemia twice? He didn't wear makeup. . . Why aren't we talking about coal ash? Why aren't we ruling out coal ash number one, first and foremost, as the potential public enemy number one?

In addition to suggesting alternate causes of the ocular melanoma and thyroid cancer clusters, some government actors have suggested that these apparently elevated rates might not indicate a problem at all. Some elected officials, government agency representatives, and researchers consulting for the state have suggested that Mooresville and Huntersville's cancer clusters may be the result of surveillance bias or migration into the area. One elected official remarked:

So the causation is just not environmental, but it's because of the heightened community awareness, transient population, inability to accurately receive data. And it's just like a perfect storm of something that creates the narrative that we have an environmental toxin... So some say there's not even a thyroid cancer problem here.

A local activist recalled hearing a similar narrative from another elected official:

[Local elected official] [has] told me that it's a migration problem because we have people coming from New England and those are the people who are getting sick. Although everyone I know who's sick has lived here for five plus years, usually longer than that.

Other participants who were involved in the government response to the clusters suggested that, rather than being related to an environmental cause, the region's elevated rates of thyroid cancer and ocular melanoma were simply a coincidence. One respondent explained:

So a lot of people are worried about coal ash up here in Iredell County . . . And you know, there's just no link. . . It's not something in the environment as best we

can tell. Right now it's a terrible coincidence and we just have to keep with the process of elimination and continue to do that. . . So is it just coincidence? Is it just because social media has picked up and all of a sudden you realize, you know, three or four other of your classmates had it or something? It could be just a terrible coincidence.

The finding that some participants, including cancer survivors themselves, internalized these diversionary frames suggests the resonance of diversionary reframing. The mother of an ocular melanoma patient wondered, “But really it's crazy, cause you start thinking, you start going, ‘Okay, is it a certain makeup? Is it makeup that we use?’ You know, cause it's mostly women. Is it some type of water we're drinking? There's just so many weird things you wonder.”

Fueling economic anxieties

Yet another measure officials took to discourage residents from speaking publicly about their concerns involved making claims that publicity around the region’s cancer clusters and corresponding environmental threats would diminish property values. Economic anxieties resulting from such claims contributed to some residents’ hesitancy to speak publicly or collectively organize around their concerns. Rumors that prospective buyers were backing out of home purchases after learning of the contamination, fueled in part by state actors worried about negative economic impacts, influenced in part some participants’ quiescence, even in spite of their environmental health grievances. One respondent indicated that she wanted to engage in public advocacy around Mooresville’s coal ash contamination but was uncomfortable doing so until she could sell her property, ensuring that her activism would not harm her family’s economic wellbeing:

And I would like to focus on the coal ash issue. But I think one issue that a lot of us who still live here have is, it's a double-edged sword. You know, we can fight the town, we can fight to get information out there. . . but what is that gonna do to our property values, right? And so right now I'm getting my house, my whole farm ready to sell. And it's because of this. I'm scared that the property values are going to nosedive.

A local journalist suggested residents' fears of harm to property values were valid, explaining,

I was 100% told that there have been sales that have been lost because of this news. . . So yes, people are selling their homes. I got an email the other day like, 'We're planning to come to Mooresville. I've got three children. I'm thinking, you know, maybe that's not a great idea.'

Lending credence to residents' economic anxieties, local officials organized and advertised a "Realtor Information Session" aimed at providing realtors with strategies for selling homes to buyers spooked by publicity around coal ash and thyroid cancer. Panelists at the event, co-sponsored by the Town of Mooresville and a mortgage firm, included local elected officials and government agency representatives. The event's tagline, "Update with facts, not fake news," angered some participants, who felt the term "fake news" was unduly dismissive of their legitimate grievances. Elected officials' implication that these environmental health concerns needed to be dispelled in order to protect the community's economic interests suggested that residents who did speak out about contamination were harming their community. This narrative led to internal conflict for some participants, who felt driven to participate in activism but did not want to inadvertently damage their communities. Officials' emphasis on potential threats to property values also implied that the economic wellbeing of the community depended on accepting any risks associated with exposure to coal ash. If coal ash did pose any risks, these risks were justified by the need to preserve the community's economic interests.

Stigmatization and vilification

While most cancer survivors did not speak publicly about their experiences, those that most vocally argued that their illnesses were related to coal ash exposure were vilified, often accused of being "overemotional," "unobjective," and "unreliable." At one public meeting held to respond to residents' concerns about Mooresville's thyroid cancer cluster, a local elected official characterized an activist as an "angry mama bear," sparking criticism from attendees who

found the appellation offensive. One respondent, a survivor of thyroid cancer, took issue with how this activist was treated by elected officials and other residents:

I didn't like the way [local elected official] portrayed her as the "mama bear." It feels like people were throwing rocks at [local activist] even though she's trying to do the right thing. They don't want to hear that about their community. So I feel like some people have been really mean to her.

The same activist was subject to more explicit attacks on her character. A respondent described how some community members dismissed the activist's grievances by relying on gendered epithets:

I never would've believed 20 years ago that we would still be in a social situation where [people] are still like, 'Oh, she's just being a bitch,' you know. But I've heard people respond to [local activist] in that way and that just sucks. They say, 'Oh, she's hysterical, hysterical. . .'"

Vilification of residents who raised environmental concerns, even of those who had survived cancer, also occurred in online settings. One participant, a thyroid cancer survivor from Mooresville, recalled interacting with an elected official on a social media website. In response to her comments describing her fear that coal ash exposure led to her illness, the official wrote that the participant was a "troll that does nothing and implores others to do more" and suggested he would report her social media account. Another respondent, the mother of a daughter who died after battling ocular melanoma, also described experiencing backlash on Internet forums. She explained receiving comments that claimed her perspective on the ocular melanoma cluster was distorted by emotion, saying,

So every now and then [on the website] there is a discussion about ocular melanoma and what's the latest and what's happening... And inevitably there is some neighbor on there that will respond with, you know, "You need to only state the facts here. What you're saying is all emotional and you have to remember that we all are a part of this community and you can't be fear mongering because if it comes a time when we need to resell our houses, this might affect new people moving in and looking at the community."

CONCLUSION

I draw on the case of thyroid cancer and ocular melanoma clusters in the Lake Norman region of North Carolina to explore social control mechanisms elites use to manipulate the public's perceptions of environmental grievances in risk societies. Rich interview data from respondents with diverse relationships to the illness clusters provided a unique dataset from which to analyze the communities' responses to the threats posed by coal ash contamination. Once they learned of the history of the region's use of coal ash as structural fill, residents began to wonder whether a link existed between the contaminant and the area's elevated rates of cancer. However, even in the face of documented contamination, neither community has seen organized activism emerge in response. I argue that residents' quiescence in this case is the result of the successful exercise of social control aimed at preventing challenges to the state's interpretation of the risks of exposure. My analysis offers four key insights to the literature on the social control of environmental activism within risk societies.

First, my findings underscore the particular mechanisms state actors employ in order to preempt the public from drawing independent conclusions about environmental risks. Previous research has established that elites effectively control the assessment of environmental threats within risk societies (Jensen and Blok 2008; Mythen 2007; Kroll-Smith and Couch 1993). My analysis offers insight into the specific tools of control state officials and other experts can use to exercise this monopoly on risk. We know that elites' power to interpret risk is bolstered by their control of information (Beck 1992; McNew-Birren 2015; Jensen and Blok 2008), but to ensure that their evaluations go unchallenged, the state must determine how to prevent citizens from developing their own assessments. In North Carolina, government actors have exercised proactive strategies of control that draw on alliances between the state and scientific experts. Elected officials have sought to prevent connections between coal ash and illness from being

drawn on the front end by controlling the public meetings residents rely on for information about their concerns. The presence of experts on government-sponsored panels lends credence to the state's dismissal of residents' fears about a connection between coal ash and cancer. When these scientists demand more evidence, concerned residents have little recourse, as they do not have the technical skills, resources or knowledge to provide the "proof" the state claims to need before remediation is possible. Some elected officials are quick to vilify residents who claim a link between coal ash and illness. This vilification sends a message to others that such claims are rooted in emotion, not objective science.

Second, my analysis deepens our understanding of how risk societies respond to cases of contamination by informing the ways *expert narratives of exposure* influence how members of the lay public conceptualize risk. Scholars have analyzed the "power games" (Beck 1992, Cable et al. 2008) involved in how modern industrialized societies manage the risks of production technologies. My work highlights how the exercise of this power translates into altering how even the most aggrieved victims of toxic exposures conceptualize risks. In Mooresville and Huntersville, elite methods of social control aimed at preempting activism around contamination did not just influence the course of debates around exposures in the public realm. Rather, these mechanisms affected residents' personal conceptions of their and their neighbors' illnesses and the risks posed by coal ash contamination. Diversionary frames promoted by state actors and collaborating scientists, such as those offering makeup and cell phone usage as possible culprits in the towns' illness clusters, undermined residents' confidence that industrial contamination was to blame. Claims that scientists had yet to establish proof that coal ash can harm human health further muddied the waters for concerned residents. Even the residents with clearest claims to

harm, such as individuals with cancer or parents who lost children to illness, rarely felt confident enough to assert a direct link between coal ash and cancer.

Third, my research demonstrates the efficacy of preempting independent risk assessments in forestalling environmental activism around industrial contamination. Researchers have described how methods of social control can influence the way citizens perceive injustices (Gaventa 1982, Shriver et al. 2014, Cable et al. 1999). Scholars have also examined how the resultant altered perceptions of injustice can prevent the emergence of movement activity in contaminated communities (Lora-Wainwright 2017; Shriver et al. 2020; Auyero and Swistun 2008). I argue that in the Lake Norman region, officials cultivated quiescence by working carefully to alter residents' conceptions of environmental risk. In this way, my work can serve as a bridge between the literatures on environmental risk and quiescence. The failure of the Mooresville and Huntersville communities to collectively identify the region's contamination as an environmental health risk suggests that state efforts to alter the public's perceptions of risk can be effective in deterring resistance to hazardous industrial practices.

Finally, my work builds on scholars' analyses of risk societies' management of environmental risks by providing a case study of how governments respond to claims of risk within a local context. Analysts have described how the prominence of experts characterizes the way risk societies deal with the hazards of industrial technologies (Beck 1992; Freudenberg and Jones 1991; Sjoberg 1999). This study clarifies how this characteristic of risk society operates in contaminated communities. Through informal, highly publicized collaborations with elected officials, scientific experts' inability to draw a link between coal ash and the illness clusters was used by the state to dismiss residents who believed coal ash posed environmental and health risks. By highlighting how municipal and state governments in risk societies respond to instances

of toxic exposure “on the ground,” the information provided by the Lake Norman case enriches our understanding of the obstacles to remediation faced by the residents of contaminated communities in risk societies.

This research also raises important questions for future scholarship. While the control mechanisms I describe have been largely successful in forestalling activism in the Lake Norman region, the efficacy of these methods will likely vary with changing political, cultural and socioeconomic settings. More information is needed about how factors such as political efficacy and trust in government affect the success of control measures aimed at manipulating the public’s interpretations of environmental risk. This study also prompts further investigation into how structural factors, such as the relationships between municipal, county and state governments in constitutional systems, influence states’ management of threats to environmental health.

REFERENCES

- Auyero, Javier and Debora Swistun. 2008. "The Social Production of Toxic Uncertainty." *American Sociological Review* 73(3):357-379.
- Bain, Carmen, and Theresa Selfa. 2013. "Framing and Reframing the Environmental Risks and Economic Benefits of Ethanol Production in Iowa." *Agriculture and Human Values* 30(3): 351-364.
- Beck, Ulrich. 1992. *Risk Society: Towards a New Modernity*. London, UK: Sage.
- Beck, Ulrich, 1996. "Risk Society and the Provident State." Pp. 27-43 in *Risk, Environment and Modernity: Towards a New Ecology*, edited by S. Lash, B. Szerszynski, and B. Wynne. London, UK: Sage.
- Beck, Ulrich. 2006. "Living in the World Risk Society: A Hobhouse Memorial Public Lecture Given on Wednesday 15 February 2006 at the London School of Economics." *Economy and Society* 35(3):329-45.
- Briggs, Chad M. 2006. "Science and Environmental Risk: the Case of Perchlorate Contamination in California". *Environmental Politics* 15(4):532-549.
- Brown, Phil, Stephen Zavestoski, Meadow Linder, Sabrina McCormick, and Brian Mayer. 2003. "Chemicals and Causalties: The Search for Causes of Gulf War Illnesses." Pp. 213-36 in *Synthetic Planet: Chemical Politics and the Hazards of Modern Life*, edited by M. Casper. New York: Routledge.
- Brown, Phil, Sabrina McCormick, Brian Mayer, Stephen Zavestoski, Rachel Morello-Frosch, Rebecca Gasior, and Laura Senier. 2006. "'A Lab of Our Own': Environmental Causation of Breast Cancer and Challenges to the Dominant Epidemiological Paradigm." *Science, Technology, and Human Values* 31:499-536.

- Cable, Sherry, Thomas E. Shriver and Donald W. Hastings. 1999. "The Silenced Majority: Quiescence and Government Social Control on the Oak Ridge Nuclear Reservation." *Research in Social Problems and Public Policy* 7:59-81.
- Cable, Sherry, Thomas E. Shriver and Tamara L. Mix. 2008. "Risk Society and Contested Illness: The Case of Nuclear Weapons Workers." *American Sociological Review* 73(3):380-401.
- Cable, Sherry. 2012. *Sustainable Failures: Environmental Policy and Democracy in a Petro-dependent World*. Philadelphia: Temple University Press.
- Earl, Jennifer. 2003. "Tanks, Tear Gas, and Taxes: Toward a Theory of Movement Repression." *Sociological Theory* 21(1)44-68.
- Earl, Jennifer. 2004. "Controlling Protest: New Directions for Research on the Social Control of Protest." *Research in Social Movements, Conflicts, and Change* 25:55-83.
- Elliot, James, and Scott Frickel. 2013. "The Historical Nature of Cities: A Study of Urbanization and Hazardous Waste Accumulation." *American Sociological Review* 78(4):521-543.
- Erikson, Kai. 1994. *A New Species of Trouble: The Human Experience of Modern Disasters*. New York: W.W. Norton and Co.
- Ferree, Myra Marx. 2005. "Soft Repression: Ridicule, Stigma, and Silencing in Gender-Based Movements." In *Repression and Mobilization*, edited by C. Davenport, H. Johnston, and C. Mueller. Minneapolis: University of Minnesota Press.
- Freudenberg, William R. and Timothy R. Jones. 1991. "Attitudes and Stress in the Presence of Technological Risk: A Test of the Supreme Court Hypothesis." *Social Forces* 69(4):1143-1168.
- Freudenburg, William R., and Margarita Alario. 2007. "Weapons of Mass Distraction:

- Magicianship, Misdirection, and the Dark Side of Legitimation 1." *Sociological Forum* 22(2).
- Frickel, Scott and M. Edwards. 2014. "Untangling Ignorance in Environmental Risk Assessment." Pp. 215-233 in *Powerless Science? The Making of the Toxic World in the 20th Century*, edited by N. Jas and S. Boudia. London: Berghahn Books.
- García, Oscar José Martín. 2014. "Soft Repression and the Current Wave of Social Mobilisations in Spain." *Social Movement Studies* 13(2): 303-308.
- Gaventa, John. 1982. *Power and Powerlessness*. Champaign, IL: University of Illinois Press.
- Giddens, Anthony. 1990. *The Consequences of Modernity*. Stanford, CA: Stanford University Press.
- Giddens, Anthony. 1991. *Modernity and Self Identity: Self and Society in the Late Modern Age*. Stanford, CA: Stanford University Press.
- Goldstein, Donna M. 2014, "Toxic Uncertainties of a Nuclear Era: Anthropology, History, Memoir" *American Ethnologist* 41(3): 579-584.
- Jameson, Frederic. 1991. *Postmodernism; or, the Cultural Logic of Late Capitalism*. London, UK: Verso.
- Jämte, Jan, and Rune Ellefsen. 2020. "The Consequences of Soft Repression." *Mobilization* 25(3): 383-404.
- Jensen, Mette and Anders Blok. 2008. "Pesticides in the Risk Society: The View from Everyday Life." *Current Sociology* 56(5):757-778.
- Kaliki, Swathi, Carol L. Shields, and Jerry A. Shields. 2015. "Uveal Melanoma: Estimating Prognosis." *Indian Journal of Ophthalmology* 63(2):93-102.
- Kroll-Smith, Steve and Stephen R. Couch. 1993. "Technological Hazards: Social Responses as

- Traumatic Stressors.” Pp. 79-91 in *International Handbook of Traumatic Stress Syndromes*, edited by J.P. Wilson and B. Raphael. New York: Plenum Press.
- Lerner, Steve. 2010. *Sacrifice Zones: The Front Lines of Toxic Chemical Exposure in the United States*. Cambridge, MA: The MIT Press.
- Lora-Wainwright, A. 2017. *Resigned Activism: Living with Pollution in Rural China*. Cambridge, MA: The MIT Press.
- McCormick, Sabrina. 2012. “After the Cap: Risk Assessment, Citizen Science and Disaster Recovery.” *Ecology and Society* 17(4).
- McNew-Birren. 2015. “‘All Policy is Local’: Punctuated Equilibrium Theory and the Politics of US Lead Contamination.” *Environmental Politics* 24(5):681-702.
- Messer, Chris, Alison E. Adams, and Thomas E. Shriver. 2012. “When Corporate Framing Fails: The Erosion of Elite Legitimacy.” *The Sociological Quarterly* 53(3):475-99.
- Messer, Chris, Thomas E. Shriver, and Alison E. Adams. 2017. “The Legacy of Lead Pollution: (Dis)Trust in Science and the Debate over Superfund.” *Environmental Politics* 26(6): 1132-1151.
- Mudu, Pierpaolo, Benedetto Terracini and Marco Martuzzi. 2014. “Human Health in Areas with Industrial Contamination.” WHO Regional Office for Europe.
- Mythen, Gabe. 2007. “Reappraising the Risk Society Thesis.” *Current Sociology* 55(6):793-813.
- Ocular Melanoma Foundation. “About Ocular Melanoma.” Retrieved November 1, 2020. (<https://www.ocularmelanoma.org/disease.htm>).
- Perrow, Charles. 1999. *Normal Accidents: Living With High Risk Technologies*. Princeton, NJ: Princeton University Press.
- Reich, Michael R. 2000. “Environmental Politics and Science: The Case of PBB Contamination

- in Michigan”. Pp. 430–52 in *Illness and the Environment: A Reader in Contested Medicine*, edited by Kroll-Smith, S., Brown, P., Gunter, V. J. New York: New York University Press.
- Roscigno, Vincent. 2011. “Power Revisited.” *Social Forces* 90(2):349-374.
- Ruhl, Laura, Avner Vengosh, Gary S. Dwyer, Heileen Hsu-Kim and Amrika Deonarine. 2009. “Survey of the Potential Environmental and Health Impacts in the Immediate Aftermath of the Coal Ash Spill in Kingston, Tennessee.” *Environmental Science and Technology* 43(16)6326-6333.
- Shriver, Thomas E. 2000. “Risk and Recruitment: Patterns of Social Movement Mobilization in a Government Town.” *Sociological Focus* 33(3):321-337.
- Shriver, Thomas E., Alison E. Adams and Chris M. Messer. 2014. “Power, Quiescence, and Pollution: The Suppression of Environmental Grievances.” *Social Currents* 1(3) 275-292.
- Shriver, Thomas E., Chris M. Messer, Jared R. Whittington, and Alison E. Adams. 2020. “Industrial Pollution and Acquiescence: Living with Chronic Remediation.” *Environmental Politics* 29(7):1219-1238.
- Sjöberg, Lennart. 1999. “Risk Perception by the Public and by Experts: A Dilemma in Risk Management.” *Human Ecology Review* 6(2):1-9.
- Stockdill, Brett C. 1996. “Multiple Oppression and Their Influence on Collective Action: The Case of the AIDS Movement.” Ph.D. dissertation, Department of Sociology, Northwestern University, Evanston, IL.
- Tilly, Charles. 1978. *From Mobilization to Revolution*. Reading, MA: Addison-Wesley Publishing Company.
- Turk, A.T. 1982. “Social Control and Social Conflict.” Pp. 249-264 in *Social Control: Views*

from the Social Sciences, edited by J.P. Gibbs. Beverly Hills, CA: Sage.

United States Census Bureau. "Explore Census Data." Accessed November 1, 2020.

<https://data.census.gov/cedsci/>

Vyner, Henry M. 1988. *Invisible Trauma: The Psychological Effects of Invisible Environmental Contaminants*. Lexington, MA: Lexington Books.