Unsafe communities: environmental injustice in carceral spaces

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Abstract

Purpose – *Research shows that the physical locations of correctional facilities often contribute to environmental hazards. Research also shows that correctional facilities are often sited near hazardous or undesirable land(s). In combination, incarcerated individuals may be at increased risk of experiencing negative health consequences because of exposure to various environmental harms. This is especially alarming as incarcerated individuals lack the capacity to decide where they are detained. In these cases, health issues that may have developed while detained may extend beyond incarceration. Furthermore, incarcerated individuals are not protected by the Environmental Protection Agency's Environmental Justice policies.*

Design/methodology/approach – *Using a case study approach, the authors examine two specific correctional facilities in the USA to not only demonstrate the various environmental harms that incarcerated individuals encounter but also highlight carceral spaces as sites of environmental violations.*

Findings – *Additionally, the authors address the negative health consequences incarcerated individuals report because of exposure to these harms. They also argue that creating safer communities requires more than reducing crime and preventing criminal victimization. Creating safer communities also includes promoting environmental safety and protection from hazards that cause sickness and disease.*

Originality/value – *This work contributes to an emerging and growing body of literature that examines the intersection of carceral studies and environmental justice.*

Keywords *Environmental justice, Case study analysis, Incarceration, Carceral spaces, Incarceration impact on health, Inequality*

Paper type *Research paper*

Introduction

Correctional facilities are often unsafe sites that expose individuals to multiple physical and mental harms. Existing literature demonstrates the alarming reality that these facilities are often built on or near undesirable lands, such as coal ash (León-Corwin *et al.*, 2023) and federally designated Superfund sites (Ashby *et al.*, 2020), contributing to environmental justice concerns with carceral spaces (Abolitionist Law Center, 2014; Bernd *et al.*, 2017; Davis, 2003; Opsal and Malin, 2019). Moreover, these facilities may also face elevated levels of ambient air pollution (Block, 2023; León-Corwin *et al.*, 2020; Toman, 2023). Exposure to such environmental health hazards significantly increases the likelihood of adverse health outcomes. Currently, incarcerated persons are often rendered invisible, if not altogether overlooked, by existing environmental justice initiatives. The Office of Environmental Justice (EPA, 2022b), for instance, exists "to facilitate [EPA] efforts to protect environmental and public health in minority, low-income, tribal and other vulnerable communities by integrating environmental justice in all programs, policies, and activities."

Exposure to environmental health hazards while incarcerated intertwines with psychological and mental health harm within correctional facilities. These facilities have been shown to not only exacerbate existing mental health issues but also create psychological harm (Estes, 2022, 2023; Grounds, 2004). Consequently, incarcerated individuals may grapple with the

Received 15 August 2023
Revised 2 December 2023
Accepted 5 December 2023

enduring effects of physical and mental health harm long after their sentence has been served. Thus, we argue that the creation of safer communities must include protecting incarcerated persons from environmental harms that may adversely affect their physical and mental health.

To address these issues and create safer communities, we must first acknowledge that incarcerated individuals are among the most vulnerable members of society. Incarcerated populations predominantly consist of marginalized individuals from racial and ethnic minority groups with lower levels of income and education (Alexander, 2012; Western and Muller, 2013; Western and Pettit, 2010; Western and Wildeman, 2009). This places them at heightened risk of encountering the criminal legal system and the physical and mental harms that accompany incarceration. Moreover, incarcerated persons are absent from current EPA protections, but they also have no agency in determining the location of their incarceration. Therefore, incarcerated individuals may be relegated to facilities that expose them to increased risk of physical and mental harm.

In response to calls from scholars to focus on carceral spaces as environmental violators, contributors to environmental harm and sites of environmental injustice (Opsal *et al.*, 2023; Opsal *et al.*, 2022), we use a case-study approach critically examining two correctional facilities in the USA: the Raymond Laborde Correctional Center in Louisiana and California Correctional Institution. We argue that carceral spaces often are environmental health hazards that expose incarcerated persons to physical and mental harm in addition to being violators of environmental laws and policies. Relatedly, we contend that the long-term health effects caused by incarceration violate the current model of punishment, which asserts that punishment must be reciprocal (measured as time spent incarcerated) to the offense. Yet this model is undermined when the effects of an individual's punishment exceed their confinement.

In the following pages, we first review the current literature as it relates to the siting of carceral spaces, the environmental hazards that incarcerated persons may be exposed to, and the harms that may come from such exposure. Next, we apply a case study methodology to examine two specific cases of carceral environmental injustice. These two cases underscore how environmental hazards create conditions of confinement that render the historically marginalized populations impacted by incarceration unsafe and show how carceral spaces contribute to environmental harm through various environmental violations. Then, we discuss our cases in the context of current literature and provide suggestions for future research. Finally, we offer recommendations for policy and praxis, along with concluding remarks.

Literature review

Carceral spaces

Carceral spaces (e.g. prisons) are often located on or near what is considered undesirable land, which includes spaces designated as coal ash dumps, old mining sites, landfills, hazardous waste collection facilities, power plants and Superfund sites (Abolitionist Law Center, 2014; Bernd *et al.*, 2017; Davis, 2003; Helppie-Schmieder, 2016; León-Corwin *et al.*, 2023; Opsal and Malin, 2019; Opsal *et al.*, 2022, 2023; Perdue, 2018). These types of land use increase the risk that individuals will be exposed to various environmental hazards and experience negative health consequences. More specifically, Helppie-Schmieder (2016) noted that persons confined in prisons reported higher rates of numerous negative health outcomes, such as cancer, emphysema and asthma, as a result of their proximity to sites of mountaintop mining, coal ash dumping, coal ash spill and hydraulic fracturing (commonly referred to as "fracking"). Relatedly, León-Corwin *et al.* (2020) examined the location of prisons in the state of Oklahoma in conjunction with toxic releases throughout the state. Results from the analyses indicated that prison zip codes had higher levels of Toxic Release

Inventory (TRI) emissions in comparison to nonprison zip codes. Chemicals included in the TRI are particularly concerning as they are not easily destroyed; therefore, they remain in the natural environment – and in our communities – for long periods of time. In fact, these chemicals have been known to accumulate in body tissue, causing cancer and other adverse chronic and acute health issues (EPA, 2023b). More recently, Block (2023) found that counties in Texas that included a state-run correctional facility had higher levels of small particulate matter in comparison to those counties that did not include a state-run facility. Still, additional studies that have examined environmental harms within prisons note water contamination, along with sewage and sanitation violations (Bernd *et al.*, 2017; Bradshaw, 2018), all of which can contribute to negative health outcomes.

When examining the physical locations of carceral spaces and the increased exposure to environmental harms, we must also consider who is incarcerated in such facilities. Since the 1970s, the criminal legal system has become increasingly punitive, resulting in the incarceration of more individuals for longer periods of time (Wakefield and Uggen, 2010; Western, 2006). Consequently, tens of millions of people in the USA have experienced incarceration (Carson, 2022; Minton and Zeng, 2021). However, experiencing incarceration has not been proportionate among all groups in society. Historically marginalized communities of color and individuals with lower incomes continue to experience incarceration at higher rates in comparison to their counterparts (Alexander, 2012; Western and Muller, 2013; Western and Pettit, 2010; Western and Wildeman, 2009), increasing their likelihood of being exposed to environmental harms and, by extension, negative health outcomes.

Negative health outcomes may be exacerbated when exposure to environmental hazards spans prolonged periods of time without cessation, as is the case for incarcerated individuals (Patterson, 2013; Perdue, 2018). The harm resulting from an individual's exposure to environmental hazards due to their confinement undermines ideals of justice in addition to community safety and well-being. To foster safer communities, it is essential that the co-location of carceral spaces and environmental health hazards is considered. This is a particularly salient issue given the tenacity of mass imprisonment wherein incarceration (in frequency and rates) of U.S. residents is unprecedented, especially among historically minoritized racial/ethnic populations (Alexander, 2012; Garland, 2001; Mauer, 2000; Rios, 2006) and socioeconomically disadvantaged communities (Toman, 2023; Vogel, 2003; cf. Wakefield and Uggen, 2010; Western, 2006).

Sociologists and criminologists have emphasized the utility of a prison proliferation framework for better understanding the nexus between space and punishment. This developing area of study is partly shaped by the fact that some communities are sites for prisons despite strong NIMBY (i.e. not in my backyard) sentiments. In the case of prisons, NIMBY-ism constitutes the common stigmatization and undesirability of these institutions because of their association with crime (Eason, 2017a; cf. Wacquant, 2002) as well as with environmental inequality (León-Corwin *et al.*, 2020, 2023; cf. McGee *et al.*, 2021; Opsal and Malin, 2019; Opsal *et al.*, 2022). Consistent with the NIMBY frame, many communities successfully resist (or altogether avoid) the placement of a prison within their boundaries; other communities, however, do become sites of prison development (Carlson, 1991; Farkas, 1999; Martin and Myers, 2005; Perdue, 2018, 2023; Perdue and Sanchagrin, 2016). Empirical evidence indicates that communities with larger minority racial or ethnic populations and greater economic inequality are disproportionately sites for prisons. For instance, Eason (2010, 2016) concluded that in addition to being largely located in the US South, communities that received a prison during the height of the prison boom, on average, had larger Black populations, larger Hispanic populations and higher poverty rates compared to communities that did not receive a prison during this era. Comparatively, other scholars have found that prison counties in Central Appalachia had lower per capita income and higher rates of poverty compared to non-prison counties during the US prison

boom (Perdue and Sanchagrin, 2016). Therefore, this phenomenon is likely to disproportionately affect communities with little social, political or economic safeguards or regulatory oversight, which results in the placement/siting of prisons in communities characterized by greater disadvantage (Toman, 2023) [1].

Some scholars, inquisitive of the roles that stakeholders play in prison development, foreground the process of prison proliferation because of its focus on the political economy to explain the development of prisons in areas of concentrated disadvantage (Eason, 2010; Eason *et al.*, 2017, pp. 204–205). Yet, we still have a limited understanding of the relationship between space and punishment, and the inequality that persists in this nexus. What we do know about this issue stems largely from scholarship focused on the political–economic conditions during the prison boom for communities in the South and in rural/nonmetropolitan settings that received a prison (Beale, 1996; Eason, 2010, 2016, 2017b; Huling, 2002). This focus provided a depiction of prison placement/siting across the USA limited to a minority of prison facilities (Maruschak and Buehler, 2021) in specific types of prison communities, such as "prison towns" (Eason, 2010, 2016, 2017b).

More recently, sociologists and criminologists have provided the groundwork for future researchers to investigate how carceral confinement coincides with environmental inequality while remaining cognizant of the existing political–economic structure in society (León-Corwin *et al.*, 2020, 2023; Opsal and Malin, 2019; Opsal *et al.*, 2022; Pellow, 2017; Perdue, 2018; Purdum *et al.*, 2021). Many of these scholars advance the prison proliferation framework. As a result, they have identified another avenue to achieving safer communities across milieus characterized by varying geographical settings and environmental conditions. They have done so within the context of diverse social, economic and political circumstances of communities across the USA. Using a case study approach, we contribute to this growing body of scholarship by illustrating the environmental inequality and environmental harm that persists through the maintenance of carceral spaces in the USA.

Exposure to environmental hazards

Exposure to environmental hazards for those incarcerated is an under-examined and environmentally unjust reality that poses many negative consequences for those incarcerated, affecting various aspects of their lives – potentially even beyond their sentences. One concerning issue is the increased vulnerability of incarcerated persons to such harms, often due to inadequate environmental health and occupational work and safety protections within correctional facilities (Pellow, 2017). Though a robust literature exposing occupational and residential-based environmental justice concerns (Bowen, 2002; Braubach and Fairburn, 2010; Pastor *et al.*, 2001), only recently has emergent scholarship explicitly considered environmental injustices as they relate to incarcerated persons (Block, 2023; Glade *et al.*, 2023; León-Corwin *et al.*, 2020). Centering the experiences of incarcerated persons is critical in understanding environmental injustices in carceral spaces because incarcerated persons *and* carceral spaces are highly susceptible to environmental harm due to the conditions of confinement and the nature of incarceration.

The growing trend of serving lengthier sentences adds to this concern (Wakefield and Uggen, 2010; Western, 2006), as prolonged incarceration means extended exposure to environmental hazards (Perdue, 2018). Whether it is, for instance, poor air quality (Block, 2023; Toman, 2023), or arsenic-contaminated water (León-Corwin *et al.*, 2023), the consequences of long-term exposure can be severe and detrimental to the health and well-being of those confined in carceral spaces. Moreover, inequality and discrimination within the criminal legal system disproportionately impact non-white racial and ethnic groups, leading to increased exposure to environmental hazards for historically marginalized populations.

We underscore the disproportionate impact on racial/ethnic groups within the criminal legal system, leading to increased exposure to environmental hazards for historically marginalized populations. The lack of equitable treatment and opportunities within the criminal legal system often results in the incarceration of marginalized individuals in facilities with higher environmental risks, perpetuating cycles of disadvantage and exacerbating health disparities. Recognizing the dimensions of environmental racism at play in the criminal legal system is crucial for advancing our understanding of the intersectionality of environmental risks and justice issues within the context of incarceration.

Negative consequences of being exposed to environmental hazards

The negative consequences of exposure to environmental hazards are far-reaching and profoundly impact human health. Multiple health implications arise from prolonged exposure to such hazards, including respiratory problems, cardiovascular diseases, neurological disorders and an increased risk of developing chronic and fatal health conditions (Bernd *et al.*, 2017; Block, 2023; León-Corwin *et al.*, 2023). Furthermore, prolonged exposure to environmental toxins and pollutants can weaken the immune system, making individuals more susceptible to infectious diseases.

Indeed, myriad scholarship has examined the impacts of environmental hazards on marginalized populations effectively demonstrating how these communities often face a disproportionate burden from pollution, toxins and other environmental health hazards (Brown, 2022; Morello-Frosch and Obasogie, 2023). This can compound existing health disparities these communities face as a result of inadequate access to medical care (Syed *et al.*, 2014), healthy foods (Hilmers *et al.*, 2012; Zenk *et al.*, 2005), and green spaces (Kim *et al.*, 2020). By extension, emergent environmental health scholarship also highlights how carceral spaces are frequently located in areas that experience high pollution and environmental health hazards, elucidating the environmental health risks faced by incarcerated individuals (Bernd *et al.*, 2017; Block, 2023; Taylor, 2023).

In addition to physical health, exposure to environmental hazards can also negatively affect mental well-being. Living in conditions where one's safety and health are constantly at risk can lead to stress, anxiety and depression, along with substance use and abuse problems (Estes, 2022, 2023; Grounds, 2004). The lack of agency and control over one's living conditions can contribute to a sense of boundlessness, hopelessness and despair, further compromising the mental health of those already experiencing the hardships of incarceration. The combination of increased exposure due to inadequate protections, limited control over incarceration locations, longer sentences and disparities within the criminal legal system undermine the health and well-being of incarcerated individuals. Recognizing and addressing these issues is essential for fostering a more just and humane criminal legal system that safeguards the health and dignity of all who are affected by it. Furthermore, understanding the harms that are produced by incarceration is critical to generating awareness as a first step toward forging safer communities for those currently incarcerated and the societies they will enter upon release (Travis, 2005).

Methods and findings

We use a descriptive case study approach to examine two state-run facilities in the USA that have a history of environmental violations, and in which incarcerated persons are subjected to environmental harms: Louisiana's Raymond Laborde Correctional Center (RLCC) and the California Correctional Institution (CCI). We selected these illustrative cases as the basis for our analysis because they are differentiated along key dimensions, including security capacity (mixed and maximum), geographic region (South and West) and geographic classification (urban and rural). Moreover, both are managed by states that are uniquely situated in terms of incarceration. For example, Louisiana has consistently had

the highest per capita incarceration rates in the USA (Bronson and Carson, 2019; Carson, 2014, 2020; Carson and Anderson, 2016), while California is notable for the total number of people that it incarcerates (Bronson and Carson, 2019; Carson, 2020; Minton and Zeng 2021). Additionally, considering these two facilities adds to the breadth of scholarly discourse (see Bradshaw, 2018; Cartier, 2020; León-Corwin *et al.*, 2020, 2023) and media reports to date that have focused primarily on a few facilities where violations of carceral environmental justice have occurred, including SCI Fayette (Abolitionist Law Center, 2014; Hopey, 2014), ADX "supermax" Florence (Berger & Associates, Inc, 1989; Cepero, 2015; Mitchell, 2019; Walkin' Steel, 1991; Waters, 2018), and Wallace Pack Unit (Bernd *et al.*, 2017; *Cole v. Livingston,* 2016; Gilna, 2016).

We contend that RLCC and CCI are less prominent but equally significant cases of carceral environmental injustice. To extend the scope of existing research in this domain, we conducted archival and qualitative content analysis of primary and secondary sources, including legal documents, media and press releases and secondary interviews. To contextualize our analysis, we also examined public-facing, facility specific information available on websites for each facility. Through this approach, we extend an emergent body of research that demonstrates the prevalence of this issue and illustrate the pervasiveness of carceral environmental inequality throughout the U.S. criminal legal system.

Raymond Laborde Correctional Center

Raymond Laborde Correctional Center (formerly known as Avoyelles Correctional Center), a state-operated mixed-security prison in rural Cottonport, Avoyelles Parish, Louisiana, presents a stark case of environmental injustice in the U.S. South. First opened in 1989 to incarcerate more than 600 individuals, the facility has undergone expansions, and it now has the capacity to incarcerate 2.5 times as many individuals with an operating budget exceeding $24m (LA Department of Public Safety and Corrections, 2023). In addition to the environmental harms caused by extreme facility growth, RLCC has demonstrated a pattern of exposing incarcerated persons to various environmental hazards and contributing to environmental harm.

In July 2014, the Louisiana Department of Corrections sought permission via permit from the Louisiana Pollutant Discharge Elimination System (LPDES) to release treated wastewater from the correctional center. The permit request acknowledged that water quality in the surrounding area may be impacted, but officials downplayed any overt adverse effects. This permit request thus appears to neglect and underestimate the extent of harm that releasing this wastewater could cause to the local environment (Louisiana Department of Environmental Quality, 2014). Therefore, persons incarcerated at this facility may be exposed to poor quality water, perhaps even unknowingly, that has the potential to affect their physical health. Notably, the Louisiana Department of Environmental Quality (2019, 2020) proposed to reissue the LPDES permit in 2020 despite acknowledging that the discharge would impact a nearby canal classified for recreational use as well as propagation of fish and wildlife species, potentially jeopardizing the well-being of the environment and the local community.

In addition to the concerns with release of wastewater, Raymond Laborde Correctional Center sits roughly 300 feet from the Cottonport Monofill tire plant (Prison Legal News, 2022). Tire plants, such as Cottonport Monofill, pose numerous environmental hazards including increased risk of fire, which releases acid smoke into the atmosphere (reRubber, 2023) and metals and cancer-causing elements into nearby air and water sources (Conserve Energy Future, 2023). On January 16, 2022, a fire broke out at the adjacent tire plant and continued throughout the remainder of the week. Despite continued release of harmful toxins from the fire, individuals incarcerated at RLCC were not evacuated until January 20, 2022 (Prison Legal News, 2022). This delayed response further demonstrates

the notable history of refusal by state governments to evacuate incarcerated populations amid developing hazardous events (Purdum *et al.*, 2021).

Prison officials attributed the evacuation to a shift in wind direction that forced the smoke plume toward the facility. During the evacuation, those incarcerated were not informed of their destination, and contact with families was restricted until after the evacuation was complete (Associated Press, 2022). Prison officials rationalized this by citing security protocols, which are often not public knowledge. Incarcerated individuals were returned to RLCC after seven days, under the assurance from officials that the nearby fire had been extinguished and particulate matter levels were so low there was no threat to human health (LeBlanc, 2022). According to a statement from the State of Louisiana Department of Environmental Quality released after the incident, the smoke from the fire at Cottonport Monofill caused visibility issues and air tests indicated elevated levels of particulate matter and volatile organic compounds (VOCs). The fire also produced pyrolytic oil at the site, which was found in local ponds; any overflow of the ponds would result in pyrolytic oil contaminating nearby agriculture and waterways (Louisiana Department of Environmental Quality, 2022). This was particularly problematic because pyrolytic oil can cause damage to the eyes and blood, and it may be fatal if ingested or inhaled (Chevron Phillips Chemical Company LP, 2020). On the other hand, exposure to tire fire smoke has been known to cause irritation to the eyes, nose and throat in addition to causing coughing, sore throat, difficulty breathing, dizziness and asthma attacks (Office of Environmental Health Hazard Assessment, 2002). Similarly, ingesting VOCs has been linked to eye, nose and throat irritation along with trouble breathing and nausea. Exposure to VOCs is also known to cause cancer and damage to the central nervous system (American Lung Association, 2023). News media covering the fire near Raymond Laborde further indicated that those incarcerated during the incident reported migraines and respiratory issues before their evacuation and weeks after the event (Brown, 2022).

Along with exposing incarcerated persons to environmental hazards, Raymond Laborde Correctional Center also has a history of environmental violations related to the Clean Water Act (CWA). The EPA provides compliance monitoring history for RLCC for the previous ten years. According to RLCC's compliance monitoring report, the correctional facility has violations that date back to 2016 and current violations from the most recently reported quarter (that is, July 7, 2023, to November 17, 2023). On three separate occasions, RLCC was responsible for discharging pollutants that violated their monthly allowance. The correctional facility also has had multiple violations for failing to submit the reports required to comply with the facility's CWA permit. The facility was in violation of the CWA for improper operation and maintenance of its equipment as well. Moreover, the facility has been late in submitting six discharge monitoring reports during three different reporting quarters since January 2020 (Environmental Protection Agency, 2022c).

The proximity to a hazardous manufacturing plant, combined with the established policy for delayed evacuation during a disaster event, illustrates that those incarcerated at Raymond Laborde Correctional Center have been subjected to environmental injustice by proximity to hazards and procedure. Additionally, RLCC has a history of violating environmental law and has routinely breached the terms of the Clean Water Act. These issues underscore the urgent need for more comprehensive environmental oversight of the siting of facilities and for the development of policies designed to protect incarcerated individuals who deserve fair treatment and consideration even amid challenging carceral circumstances. Furthermore, facilities need to be held accountable when it is determined that they have violated environmental policies and laws.

California Correctional Institution

California Correctional Institution is in Tehachapi, California, near urban Kern County in the US West. CCI, which consists of five state-operated maximum-security facilities, has the

capacity to incarcerate just under 2,000 persons (California Department of Corrections & Rehabilitation, 2023a). CCI originally opened in 1933 to incarcerate women, but it transitioned to an institution for men in 1954 after temporarily closing following the 1952 Kern County earthquake (Southern California Earthquake Center, 2022). From 1985 to 1987, CCI rapidly expanded, adding three of its five facilities (California Department of Corrections & Rehabilitation, 2023b). Persisting alongside the continued expansion and re-opening of CCI are the presence of environmental hazards and regulatory violations that have significantly impacted the health and well-being of those incarcerated there as well as the surrounding community.

This correctional institution has a history marred by environmental injustices. Notably, one legal case resulted in a settlement of $10,000 for the plaintiff, who was exposed to wastewater leaking from a broken toilet in their cell (*Chatman v. Tyner*, 2010). Exacerbating the plaintiff's exposure to hazardous wastewater, the individual was left "without footwear" for over two weeks, during which they became "seriously ill" from being forced to withstand these conditions (Prison Legal News, 2011). These conditions mirror the findings of an environmental site assessment published in 2018 regarding California Correctional Institution. According to this report (GeoTek, Inc, 2018), CCI is adjacent to a leaking underground storage tank (LUST), which involves "the release of a fuel product from an underground storage tank that can contaminate surrounding soil, groundwater, or surface waters, or affect indoor air spaces" (EPA, 2023a). The most common contaminants of concern with LUSTs include methyl tert-butyl ether (MTBE) and lead scavengers, such as ethylene dibromide (EDB) and ethylene dichloride (EDC), which have been linked to adverse outcomes for human nervous systems, respiratory systems and cardiovascular systems, respectively (Agency for Toxic Substances and Disease Registry, 2014; EPA, 2022a). The GeoTek, Inc (2018) report noted that CCI is located on a parcel of land that hosts a Hazardous Waste Generator, designated as such by the Resource Conservation and Recovery Act (RCRA), and that serves as a landfill.

Compounding the issues of exposure to harmful environmental conditions is that CCI is not adequately equipped to provide sufficient medical care to those incarcerated at this facility. For example, CCI was included in a medical inspection conducted between September 2008 and January 2010. The medical inspection consisted of 166 questions to evaluate compliance on twenty different components related to medical care provided at the prisons. Medical components in the inspection include areas such as chronic care, emergency services, health screenings, diagnostic services and preventive services to name a few (State of California Bureau of Audits and Investigations, 2010). The average score among all facilities included in the inspection was 70%, with the lowest score at 62% and the highest at 78%. CCI received the lowest score in preventive services compliance, such as cancer screening, tuberculosis evaluation and influenza immunizations, scoring an abysmal 7% compliance (Brodheim, 2011; State of California Bureau of Audits and Investigations, 2010).

CCI has a long history of environmental violations as well. For instance, from 2011 to 2015, this facility was cited more than one dozen times for water- and sewage-related violations. Violations at CCI have included instances in which there were higher levels of coliform bacteria and nitrogen than were allowed in addition to an 80,000-gallon sewage spill (Anderson, 2017). Furthermore, according to the EPA's compliance monitoring report, CCI was in violation of the Safe Drinking Water Act (SDWA) in three quarters over the previous five years. Violations of SDWA included improper water treatment techniques leading to increased levels of lead and copper in water samples and failing to aptly monitor and report these increased levels to the appropriate agency (Environmental Protection Agency, 2022d).

Overall, individuals incarcerated at California Correctional Institution are exposed to numerous environmental hazards, which can cause a variety of illnesses, potentially outlasting the length of their prison sentences. Evidence also has indicated that CCI does

not provide proper medical care to mitigate any medical issues that may occur while individuals are incarcerated at the facility. Additionally, CCI has had a history of repeatedly violating federal environmental regulations. Thus, CCI has perpetuated multiple environmental harms among not only the population of people incarcerated there but also the surrounding community.

Discussion

Individuals experience multiple harms during incarceration due to the conditions of their confinement. Here, we have underscored the presence of multiple environmental hazards and harms in carceral spaces, focusing on known incidents of exposure to health hazards that incarcerated persons have encountered in the USA. In doing so, our study aligns with literature (Ashby *et al.*, 2020; Helppie-Schmieder, 2016; Perdue, 2018) that highlights how carceral spaces are co-located with environmental health hazards, leading to unsafe conditions for those confined. The cumulative effects of this exposure can lead to lasting negative health consequences that persist long after an individual has served their sentence. Additionally, carceral spaces have been known to exacerbate and even create mental health issues that can persist over time (Grounds, 2004). Our findings emphasize that the unhealthy conditions prevalent in carceral spaces do not contribute to safer communities. Thus, if we are to foster safer communities, we must address the hazardous conditions of confinement that incarcerated persons endure.

This alignment with the literature underscores the persistence of environmental hazards within and around carceral spaces (Ashby *et al.*, 2020; León-Corwin *et al.*, 2020; Toman, 2023). Importantly, it reinforces the intersection of environmental health and justice issues within the context of incarceration. Our study also draws attention to environmental justice concerns within the criminal legal system. Recognizing the dimensions of environmental racism involved is critical for understanding the full scale of inequities embedded throughout incarceration. Indeed, the environmental injustices that occur in the criminal legal system perpetuate cycles of disadvantage and exacerbate health disparities (Bernd *et al.*, 2017; Block, 2023; Taylor, 2023).

Although we use a case study approach, in which we critically review instances of carceral environmental injustice on a case-by-case basis, it is essential to recognize that these unhealthy conditions of confinement are not isolated to specific facilities or locations (Bernd *et al.*, 2017; Block, 2023; Bradshaw, 2018; Helppie-Schmieder, 2016; León-Corwin *et al.*, 2020, 2023; Opsal *et al.*, 2022; cf. Perdue, 2018, 2023; Toman, 2023). Irrespective of facility location, size, security or governing body, hazardous carceral conditions persist. The negative conditions of confinement endure, at times spanning decades, with full awareness by relevant entities, persons and/or organizations of the potential harms that can or do exist in carceral spaces. Therefore, achieving safer communities must include recognizing the potential damage that can be caused while experiencing incarceration, considering that the majority of individuals currently incarcerated will reenter society (Travis, 2005), while managing the lasting impact of their confinement upon release.

The current model of incarceration, focused on punishment and subsequent release, overlooks the long-term consequences of confinement in unsafe carceral spaces (Davis, 2003). This model assumes that once an individual's time is served, they are free to live their life and act as a productive member of society. We contend, however, that there is more to punishment than simply confining an individual for a period of time and then releasing them. The prevailing model wholly ignores the long-term consequences of confinement, which can perpetuate the vulnerability of incarcerated individuals, thereby contributing to overall high rates of recidivism (Western, 2018). As a result, this model could, in essence, contribute to unsafe communities. This issue is compounded when we consider the unequal rates of incarceration among individuals from lower-income backgrounds and communities of color (Alexander, 2012; Garland, 2001; Mauer, 2000; Rios, 2006; Toman, 2023: Vogel, 2003;

cf. Wakefield and Uggen, 2010; Western, 2006). These groups experience an increased risk of incarceration and are subject to the many harms that exist in carceral spaces, often without the necessary resources to help them heal from the harm inflicted by incarceration. Thus, it is imperative that our efforts toward fostering safer communities extend to all communities, including incarcerated ones.

Additionally, we highlight correctional facilities as contributors to environmental harms through the various violations of environmental regulations that are frequently committed in these spaces. Our findings here align with and bolster the findings of other scholars who have recently characterized prisons as not only sites of environmental injustice but also spaces that commit crimes through violation of environmental laws and policies (Opsal *et al.*, 2022, 2023). Ironically, carceral spaces are often defined and justified as locations for punishing individuals that have violated laws; yet, the processes and events that underlie correctional facilities routinely result in law violations. This revelation is indicative of a double standard, which has the potential to delegitimize the criminal legal system, thereby making citizens less likely to trust and abide by the laws and policies set forth by that system. Thus, the maintenance of carceral spaces, which frequently serve as sites of environmental violations and carceral environmental injustice, may contribute to rates of crime and incarceration, perhaps increasing the number of individuals exposed to environmental harms that exist in such spaces and creating *un*safe communities.

Recommendations for policy and praxis

In this study, we have acknowledged that carceral spaces are nontherapeutic and that they are often sites of perpetual harm for individuals who are incarcerated. Based on our findings, we recommend the following policy- and practiced-based interventions. First, we recommend that scholars, political leaders, practitioners and community members review approaches to replace carceral spaces in ways that attenuate harms. Presently, carceral spaces often expose incarcerated individuals to environmental harms that may jeopardize their physical health and well-being in addition to creating or exacerbating mental health issues. These harms have the potential to follow individuals long after their sentence has been served. We contend that continuing to punish individuals after their release does not align with current conceptions of justice.

To advance ideals of environmental justice in carceral spaces, scholars, practitioners, political officials and community leaders must seriously consider the proposed alternatives to incarceration (Perdue, 2018). In doing so, professionals should not discount the potential for the abolishment of imprisonment *as we know it* and what the related processes may entail (Bagaric *et al.*, 2021; Davis, 2003; Purdum *et al.*, 2021; Shenkin, 2021). Prison abolition is often assumed to be (and therefore dismissed as) too idealist, utopian or lenient, yet prison abolition is not simply about elimination (Lewis, 2022; Ward Frampton, 2022). Rather, it may be viewed as the reconstruction of social relations and interrelated institutions in ways that optimize individual and community health, safety and well-being without relying first and foremost on the deliberate suffering of individuals as an act of retribution for their perceived wrongdoing (Purdum *et al.*, 2021). Thus, as we reconsider notions of community safety and well-being, we should heed calls for prison abolition and imagine its potential utility in promoting safer communities for imprisoned and nonimprisonment individuals alike.

In the interim, we recommend that policy- and lawmakers expand their purview to include incarcerated individuals. This includes extending existing environmental law to include carceral populations, which would leverage existing efforts at ameliorating environmental justice toward a vulnerable population. We also suggest regular comprehensive environmental health audits of correctional facilities, which could help identify and track environmental health hazards and mitigate the corresponding risks associated with them. Relatedly, when carceral spaces are found to commit environmental violations, swift and proportionate sanctions should be applied. Furthermore, allocating funding for remediation

and upgrading of dated correctional facilities could serve to minimize the environmental harms that exist in aging infrastructure across the carceral system (Stevens *et al.*, 2022). Each of these measures would help create safer spaces for incarcerated individuals, but also those who work or live near carceral facilities.

By extension, addressing the root cause of factors that contribute to incarceration would further contribute to a more inclusive vision of safer communities. Thus, targeted interventions with those at higher risk of encountering the carceral system by investing in better education and employment opportunities – in quantity and quality – could serve to reduce the risk of individuals experiencing incarceration in the first place (Apel and Sweeten, 2010; Barnert *et al.*, 2021). Similarly, the federal decriminalization or legalization of what are currently defined as neither violent nor capital offenses, in addition to reconsideration of mandatory minimum sentencing guidelines, early parole guidelines and use of alternative sentencing, may accelerate decarceration and effectively reduce the number and length of prison sentences, thereby further curtailing people's exposure to environmental health hazards. In several instances, decriminalization efforts have included the repeal of mandatory minimum penalties for drug-related offenses and allowed judges to order treatment programs or community corrections programs rather than prison (Pew, 2016). Yet, the impact of decriminalization or legalization of drug-related offenses in US states – let alone the existence of such efforts – has been disproportionate without reform at the federal level of government. Moreover, recognizing that most incarcerated individuals re-enter society, but that conditions upon release and various social factors increase recidivism, we also call for bolstered support for community re-entry programs.

Limitations and directions for future research

The findings from our study should be considered within the context of some limitations. First, concerning the scope of our study, we focused solely on state correctional facilities, which are often used to confine individuals for longer periods of time compared to city jails or county detention centers (Bureau of Justice Statistics, 2023; National Institute of Justice, 2023). Future research should broaden the scope to include other facilities where individuals are temporarily confined, including instances where they are awaiting trial and sentencing, such as city and county jails. This approach would contribute to a comprehensive understanding of environmental injustice in carceral spaces. This expansion could shed light on the potential differences, or continuities, that exist in the kind of environmental health hazards incarcerated persons are exposed to throughout all facets of the carceral system. In this vein, future studies should also examine city and county jails as potential sites of environmental violations to see if our findings extend to all carceral spaces.

Second, while our study provides valuable insights into environmental conditions in carceral spaces, our study lacks direct voices or experiences of those who have served time in carceral spaces. In future studies, researchers should work to include qualitative interviews with formerly incarcerated individuals to allow them the opportunities to speak on their own experiences in ways our research cannot. Relatedly, future studies should also include information from those who are employed within carceral spaces to more thoroughly understand the environmental impacts on their health and well-being. Although our focus here has been on incarcerated individuals, correctional officers and staff are similarly subjected to hazardous conditions of confinement through occupational exposure. Additionally, as we have discussed the interconnectedness of incarceration with other social factors (i.e. mental and physical health, race, socioeconomic status), we acknowledge that our study fails to recognize the diversity of experiences that individuals may have with the criminal legal system. Recognizing that individuals encounter the carceral system contingent upon a variety of social factors, we encourage future research to adopt an intersectional analytic approach that goes beyond understanding individuals in the carceral system upon a single dimension based on their incarceration.

In addition, we encourage scholars to continue conducting comparative case studies of different carceral spaces to continue to draw attention and awareness to the various harms that exist within and because of the US criminal legal system. This line of inquiry would also benefit from scholars extending their environmental focus to include an intersectional approach examining the conditions of confinement more broadly to provide a more holistic understanding of the harms caused by incarceration and their long-term consequences.

Finally, incarcerated individuals, already deprived of their freedom and autonomy (Sykes, 1958/2007), find themselves with little to no control over their environment, making them vulnerable to hazardous conditions beyond their control. To this end, researchers may further advance the concept of "pains of imprisonment" by highlighting additional pains of imprisonment – those imposed by prolonged exposure to environmental health hazards – omitted in Sykes' original formulation (Haggerty and Bucerius, 2020; Shammas, 2017). Undertaking such an effort stands to clarify two matters. First, it may elucidate the ways in which harms stemming from environmental health hazards and regulatory violations constitute distinctively modern pains that persist within prisons, but that also extend to broader prison communities, as the result of using prisons and imprisonment as a panacea. Relatedly, it can help us better understand how and why these additional pains of imprisonment are the products of the political-economic structure of contemporary US society.

Conclusion

US states continue to incarcerate a large portion of their populations, generating a concerning reality in which many individuals are subjected to various environmental harms as a result of their confinement. This exposure can lead to lasting negative health implications that effectively perpetuate the punishment of an individual subsequent to their release. Here, we have shown that environmental harms exist within state correctional facilities in the USA, further documenting the systemic nature of environmental injustice within carceral spaces. By emphasizing the presence of environmental harms within these facilities, we underscore the urgency of addressing this critical aspect of environmental justice. Safeguarding all individuals, incarcerated or otherwise, from exposure to environmental hazards should be an integral part of creating safer communities. To achieve this, we advocate for a more inclusive definition of safer communities that includes protecting individuals from environmental harms that can inflict dire physical health outcomes.

As we move forward, it is essential to recognize that achieving environmental justice in carceral spaces is not only a matter of individual health and well-being but also a matter of social justice. Rather than centering simply on crime prevention and deterrence, the pursuit of safer communities must accommodate the health and well-being of all members of society. In doing so, it should include protecting individuals from environmental health hazards that can have far-reaching consequences on their lives and health. By prioritizing carceral environmental justice, we take a critical step toward building a more equitable society, where all members are valued and protected. This endeavor calls for a collective commitment to transformative change and upholding the principles of justice, upon which our criminal legal system is founded, for every individual, both within and beyond the confines of incarceration.

Note

1. See Eason (2017a, 2017b) for definitions and discussions of the conceptual distinction between prison placement and prison siting.

References

Abolitionist Law Center (2014), "No escape: exposure to toxic coal waste at State Correctional Institution Fayette", available at: https://abolitionistlawcenter.org/wp-content/uploads/2014/09/no-escape-3-3mb.pdf (accessed 15 April 2019).

Agency for Toxic Substances and Disease Registry (2014), "Medical management guidelines for ethylene dibromide", available at: wwwn.cdc.gov/TSP/MMG/MMGDetails.aspx?mmgid=1143&toxid=251#:~:text=Health%20Effects%201%20Ethylene%20dibromide%20is%20a%20liquid,conversion%20to%20the%20cell%20toxicant%202-bromoacetaldehyde.%20More%20items (accessed 20 April 2023).

Alexander, M. (2012), *The New Jim Crow: Mass Incarceration in an Era of Colorblindness*, The New Press, New York, NY.

American Lung Association (2023), "Volatile organic compounds", available at: www.lung.org/clean-air/indoor-air/indoor-air-pollutants/volatile-organic-compounds (accessed 10 November 2023).

Anderson, R. (2017), "California prisons struggle with environmental threats from sewage spills, contaminated water, airborne disease", *Prison Legal News*, available at: www.prisonlegalnews.org/news/2017/dec/5/california-prisons-struggle-environmental-threats-sewage-spills-contaminated-water-airborne-disease/#:~:text=Prison%20Legal%20News-,California%20Prisons%20Struggle%20with%20Environmental%20Threats,Spills%2C%20Contaminated%20Water%2C%20Airborne%20Disease&text=Filed%20under%3A%20Conditions%20of%20Confinement,%2C%20Plumbing%2C%20Sewage%2C%20Sanitation (accessed 11 November 2023).

Apel, R. and Sweeten, G. (2010), "The impact of incarceration on employment during the transition to adulthood", *Social Problems*, Vol. 57 No. 3, pp. 448-479.

Ashby, H., Vazin, J. and Pellow, D. (2020), "Superfund sites and juvenile detention: proximity analysis in the Western United States", *Environmental Justice*, Vol. 13 No. 3, pp. 65-74.

Associated Press (2022), "Prison evacuating 1500 because of tire fire at closed plant", available at: https://apnews.com/article/business-louisiana-fires-prisons-f328522e75248e80d5289e1d110e7805 (accessed 14 February 2023).

Bagaric, M., Hunter, D. and Svilar, J. (2021), "Prison abolition", *The Journal of Criminal Law and Criminology*, Vol. 111 No. 2, pp. 351-406.

Barnert, E.S., Perry, R., Shetgiri, R., Steers, N., Dudovitz, R., Heard-Garris, N.J., Zima, B. and Chung, P.J. (2021), "Adolescent protective and risk factors for incarceration through early adulthood", *Journal of Child and Family Studies*, Vol. 30 No. 6, pp. 1428-1440.

Beale, C.L. (1996), "Rural prisons: an update", *Rural Development Perspectives*, Vol. 11 No. 2, pp. 25-27.

Berger & Associates, Inc (1989), "Florence, Colorado federal correctional complex: final environmental impact statement", available at: https://babel.hathitrust.org/cgi/pt?id=ien.35556031218936&view=1up&seq=1 (accessed 31 July 2023).

Bernd, C., Loftus-Farren, Z. and Mitra, M.N. (2017), "America's toxic prisons: the environmental injustices of mass incarceration", *Earth Island Journal and Truthout*, www.earthisland.org/journal/index.php/magazine/entry/americas_toxic_prisons (accessed 2 March 2019).

Block, K. (2023), "Examining $PM_{2.5}$ concentration in counties with and without state-run correctional facilities in Texas", *Punishment & Society*, Vol. 26 No. 1, pp. 32-52, doi: 10.1177/14624745231178906.

Bowen, W. (2002), "An analytical review of environmental justice research: what do we really know?", *Environmental Management*, Vol. 29 No. 1, pp. 3-15.

Bradshaw, E.A. (2018), "Tombstone towns and toxic prisons: prison ecology and the necessity of an anti-prison environmental movement", *Critical Criminology*, Vol. 26 No. 3, pp. 407-422.

Braubach, M. and Fairburn, J. (2010), "Social inequities in environmental risks associated with housing and residential location–a review of the evidence", *European Journal of Public Health*, Vol. 20 No. 1, pp. 36-42.

Brodheim, M. (2011), "CA inspector general finds 15 of 17 prisons demonstrate low adherence to established medical policies and procedures", *Prison Legal News,* available at: www.prisonlegalnews.org/news/2011/may/15/ca-inspector-general-finds-15-of-17-prisons-demonstrate-low-adherence-to-established-medical-policies-and-procedures/ (accessed 8 November 2023).

Brown, A. (2022), "Burning tires left Louisiana prisoners with migraines, breathing problems and minimal medical care", available at: https://theintercept.com/2022/03/13/louisiana-prison-tire-fire-air-pollution/ (accessed 1 August 2023).

Bronson, J. and Carson, E.A. (2019), "Prisoners in 2017", *Bureau of Justice Statistics*, available at: https://bjs.ojp.gov/library/publications/prisoners-2017 (accessed 28 November 2023).

Bureau of Justice Statistics (2023), "Correctional institutions", available at: https://bjs.ojp.gov/topics/corrections/correctional-institutions (accessed 31 July 2023).

Chatman v. Tyner (2010), *Chatman v. Tyner*. U.S.D.C. (E.D. Cal.), Case No. 1:03-cv-06636-AWI-SMS.

California Department of Corrections & Rehabilitation (2023a), "Monthly report of population", available at: www.cdcr.ca.gov/research/wp-content/uploads/sites/174/2023/08/Tpop4_d2307.pdf (accessed 1 August 2023).

California Department of Corrections & Rehabilitation (2023b), "California correctional institution (CCI)", available at: www.cdcr.ca.gov/facility-locator/cci/ (accessed 19 April 2023).

Carlson, K.A. (1991), "What happens and what counts: resident assessments of prison impacts on their communities", *Humboldt Journal of Social Relations*, Vol. 17 Nos 1/2, pp. 211-237.

Carson, E.A. (2014), "Prisoners in 2013", *Bureau of Justice Statistics*, available at: https://bjs.ojp.gov/library/publications/prisoners-2013 (accessed 28 November 2023).

Carson, E.A. (2020), "Prisoners in 2019", *Bureau of Justice Statistics*, available at: https://bjs.ojp.gov/library/publications/prisoners-2019 (accessed 28 November 2023).

Carson, E.A. (2022), "Prisoners in 2021 – statistical tables", *Bureau of Justice Statistics*, available at: https://bjs.ojp.gov/sites/g/files/xyckuh236/files/media/document/p21st_sumB.pdf (accessed 17 July 2023).

Carson, E.A. and Anderson, E. (2016), "Prisoners in 2015", *Bureau of Justice Statistics*, available at: https://bjs.ojp.gov/library/publications/prisoners-2015 (accessed 28 November 2023).

Cartier, K.M. (2020), "An unfought geoscience battle in U.S. Prisons", *Eos*, available at: https://eos.org/features/an-unfought-geoscience-battle-in-u-s-prisons (accessed 31 July 2023).

Cepero, L. (2015), "Toxic traps: environmental hazards threaten two federal super-max prisons", *Prison Legal News*, available at: www.prisonlegalnews.org/news/2015/oct/26/toxic-traps-environmental-hazards-threaten-two-federal-supermax-prisons/ (accessed 31 July 2023).

Chevron Phillips Chemical Company LP (2020), "Heavy pyrolysis oil: safety data sheet", available at: www.cpchem.com/sites/default/files/2020-05/01541489_6.pdf (accessed 28 November 2023).

Cole v. Livingston (2016), *Cole v. Livingston*. 4-14-CV-1698 (S.D. Tex 2016).

Conserve Energy Future (2023), "Tire manufacturing leaders: environmental protection is in our hands", available at: www.conserve-energy-future.com/tire-manufacturing-leaders.php (accessed 31 July 2023).

Davis, A.Y. (2003), *Are Prisons Obsolete*? Seven Stories Press, New York, NY.

Eason, J. (2010), "Mapping prison proliferation: region, rurality, race, and disadvantage in prison placement", *Social Science Research*, Vol. 39 No. 6, pp. 1015-1028.

Eason, J.M. (2016), "Reclaiming the prison boom: considering prison proliferation in the era of mass imprisonment", *Sociology Compass*, Vol. 10 No. 4, pp. 261-271.

Eason, J.M. (2017a), *Big House on the Prairie: Rise of the Rural Ghetto and Prison Proliferation*, University of Chicago Press, Chicago, IL.

Eason, J.M. (2017b), "Prisons as panacea or pariah? The countervailing consequences of the prison boom on the political economy of rural towns", *Social Sciences*, Vol. 6 No. 1, pp. 1-23.

Eason, J.M., Zucker, D. and Wildeman, C. (2017), "Mass imprisonment across the rural-urban interface", *The Annals of the American Academy of Political and Social Science*, Vol. 672 No. 1, pp. 202-216.

Environmental Protection Agency (2022a), "Contaminants of concern (COC) at underground storage tank (UST) sites", available at: www.epa.gov/ust/contaminants-concern-coc-underground-storage-tank-ust-sites (accessed 19 April 2023).

Environmental Protection Agency (2022b), "Learn about environmental justice", available at: www.epa.gov/environmentaljustice/learn-about-environmental-justice (accessed 9 August 2023).

Environmental Protection Agency (2022c), "Detailed facility report", available at: https://echo.epa.gov/detailed-facility-report?fid=110003261425&ej_type=sup&ej_compare=US (accessed 15 November 2023).

Environmental Protection Agency (2022d), "Detailed facility report", available at: https://echo.epa.gov/detailed-facility-report?fid=110014022477&ej_type=sup&ej_compare=US (accessed 15 November 2023).

Environmental Protection Agency (2023a), "Leaking underground storage tanks corrective action resources", available at: www.epa.gov/ust/leaking-underground-storage-tanks-corrective-action-resources#:~:text=Immediate%20response%20actions-,Introduction,or%20affect%20indoor%20air%20spaces (accessed 19 April 2023).

Environmental Protection Agency (2023b), "TRI listed chemicals", available at: www.epa.gov/toxics-release-inventory-tri-program/tri-listed-chemicals (accessed 17 July 2023).

Estes, M.L. (2022), "It's really hard making up for all of that lost time': providing reentry support after wrongful incarceration", *The Wrongful Conviction Law Review*, Vol. 3 No. 1, pp. 60-81.

Estes, M.L. (2023), "We can't, sorry, but we can't do it': how wrongful convictions impact employment and education throughout the life-course", *Journal of Offender Rehabilitation*, Vol. 62 No. 5, pp. 275-296.

Farkas, M.A. (1999), "Not in my backyard': the issues and complexities surrounding prison siting", *The Justice Professional*, Vol. 12 No. 1, pp. 95-109.

Garland, D. (2001), "Introduction: the meaning of mass imprisonment", *Punishment and Society*, Vol. 3 No. 1, pp. 5-7.

GeoTek, Inc (2018), "Phase 1: environmental site assessment for DGS California correctional institution 24900 highway 202 Tehachapi, California", Prepared for ForeFront Power DGS California Correctional Institute, Project number 1863-CR-ESA.

Gilna, D. (2016), "Federal judge orders Texas department of criminal justice to provide safe water to prisoners", *Prison Legal News*, available at: www.prisonlegalnews.org/news/2016/nov/7/federal-judge-orders-texas-department-criminal-justice-provide-safe-water-prisoners/ (accessed 31 July 2023).

Glade, S., Schmitz, C., Barron, B.N., Dashti, S., Roudbari, S., Liel, A.B., Pezzullo, P.C. and Miller, S.L. (2023), "Hazards and incarceration facilities: evaluating facility-level exposure to floods, wildfires, extreme heat, and landslides in Colorado", *Natural Hazards Review*, Vol. 25 No. 1, pp. 1-13.

Grounds, A. (2004), "Psychological consequences of wrongful conviction and imprisonment", *Canadian Journal of Criminology and Criminal Justice*, Vol. 46 No. 2, pp. 165-182.

Haggerty, K.D. and Bucerius, S. (2020), "The proliferating pains of imprisonment", *Incarceration*, Vol. 1 No. 1, pp. 1-16.

Helppie-Schmieder, B. (2016), "Toxic confinement: can the eighth amendment protect prisoners from human-made environmental health hazards?", *Northwestern University Law Review*, Vol. 110 No. 3, pp. 647-677.

Hilmers, A., Hilmers, D.C. and Dave, J. (2012), "Neighborhood disparities in access to healthy foods and their effects on environmental justice", *American Journal of Public Health*, Vol. 102 No. 9, pp. 1644-1654.

Hopey, D. (2014), "Groups say fly ash near state prison in Fayette county causing health problems", *Pittsburgh Post-Gazette*, available at: www.postgazette.com/news/health/2014/09/02/Groups-say-fly-ash-near-state-prison-in-Fayette-County-leads-to-health-prolems/stories/201409020040 (accessed 31 July 2023).

Huling, T. (2002), "Building a prison economy in rural America", in Mauer, M. and Chesney-Lind, M. (Eds), *Invisible Punishment: The Collateral Consequences of Mass Imprisonment*, The New Press, New York, NY, pp. 197-213.

Kim, J., Lee, K.J. and Thapa, B. (2020), "Visualizing fairness: distributional equity of urban green spaces for marginalized groups", *Journal of Environmental Planning and Management*, Vol. 65 No. 5, pp. 833-851.

LA Department of Public Safety and Corrections (2023), "Raymond laborde correctional center", available at: https://doc.louisiana.gov/location/raymond-laborde-correctional-center/ (accessed 14 February 2023).

LeBlanc, J.M. (2022), "Evacuated inmates to return to Raymond laborde correctional center", available at: https://myemail.constantcontact.com/Evacuated-Inmates-to-Return-to-Raymond-Laborde-Correctional-Center.html?soid=1125804998217&aid=v9c3erU_DaM (accessed 14 February 2023).

León-Corwin, M., McElroy, J.R. and Estes, M.L. (2023), "Incarceration and environmental inequality", in Long, M.A., Lynch, M.J. and Stretesky, P.B. (Eds), *Handbook on Inequality and the Environment*, Edward Elgar Publishing, Northhampton, MA, pp. 405-428.

León-Corwin, M., McElroy, J.R., Estes, M.L., Lewis, J. and Long, M.A. (2020), "Polluting our prisons? An examination of Oklahoma prison locations and toxic releases, 2011-2017", *Punishment & Society*, Vol. 22 No. 4, pp. 413-448.

Lewis, R. (2022), "Prison abolition and reform in Australia: A case for campaigners to take abolition seriously", *Alternative Law Journal*, Vol. 47 No. 4, pp. 279-85.

Louisiana Department of Environmental Quality (2014), "Louisiana department of environmental quality issues draft water discharge permit-Louisiana department of corrections/avoyelles correctional center AI number 76989", *Targeted News Service*, available at: www.proquest.com/wire-feeds/louisiana-department-environmental-quality-issues/docview/1547822890/se-2 (accessed 18 July 2023).

Louisiana Department of Environmental Quality (2019), "Public notice: Louisiana department of public safety and corrections, Raymond Laborde correctional center draft water discharge permit", available at: https://edms.deq.louisiana.gov/app/doc/view?doc=12042213&ob=yes&child=yes (accessed 9 August 2023).

Louisiana Department of Environmental Quality (2020), "Draft permit package: Louisiana department of public safety and corrections, Raymond Laborde correctional center draft water discharge permit", available at: https://edms.deq.louisiana.gov/app/doc/view?doc=12026297&ob=yes&child=yes (accessed 9 August 2023).

Louisiana Department of Environmental Quality (2022), "Declaration of emergency", available at: www.deq.louisiana.gov/assets/CottonportER.pdf (accessed 11 November 2023).

McGee, J.A., Greiner, P.T. and Appleton, C. (2021), "Locked into emissions: how mass incarceration contributes to climate change", *Social Currents*, Vol. 8 No. 4, pp. 326-340.

Martin, R. and Myers, D.L. (2005), "Public response to prison siting: perceptions of impact on crime and safety", *Criminal Justice and Behavior*, Vol. 32 No. 2, pp. 143-171.

Maruschak, L.M. and Buehler, E.D. (2021), "Census of state and federal adult correctional facilities, 2019 – statistical tables", *Bureau of Justice Statistics*, available at: https://bjs.ojp.gov/content/pub/pdf/csfacf19st.pdf (accessed 17 July 2023).

Mauer, M. (2000), "Young black Americans and the criminal justice system", in James, J. (Ed.), *States of Confinement: Policing, Detention, and Prisons*, Palgrave Macmillan, New York, NY, pp. 75-84.

Minton, T.D. and Zeng, Z. (2021), "Jail inmates in 2020 – statistical tables", *Bureau of Justice Statistics*, available at: https://bjs.ojp.gov/content/pub/pdf/ji20st.pdf (accessed 29 March 2023).

Mitchell, K. (2019), "Colorado's supermax prison now occupied by El Chapo is 'worse than death,' ex-warden said", *Canon City Daily Record*, available at: www.canoncitydailyrecord.com/2019/07/27/supermax-el-chapo-escape-mentally-ill/ (accessed 31 July 2023).

Morello-Frosch, R. and Obasogie, O.K. (2023), "The climate gap and the color line-racial health inequities and climate change", *New England Journal of Medicine*, Vol. 388 No. 10, pp. 943-949.

National Institute of Justice (2023), "Correctional facilities", available at: https://nij.ojp.gov/topics/corrections/correctional-facilities#:~:text=Prisons%20are%20state%20or%20federal,less%20%E2%80%94%20and%20those%20awaiting%20trial (accessed 31 July 2023).

Office of Environmental Health Hazard Assessment (2002), "Tire fire report", available at: https://ww2.arb.ca.gov/sites/default/files/classic/research/apr/reports/l871.pdf (accessed 1 August 2023).

Opsal, T. and Malin, S.A. (2019), "Prisons as LULUs: understanding the parallels between prison proliferation and environmental injustices", *Sociological Inquiry*, Vol. 90 No. 3, pp. 579-602.

Opsal, T., Malin, S.A. and Ellis, T. (2022), "Prisons as law-violators and sites of environmental injustice", *Critical Criminology*, Vol. 31 No. 1, pp. 105-125.

Opsal, T., Luzbetak, A., Malin, S. and Luxton, I. (2023), "Layered sites of environmental justice: considering the case of prisons", *Sociological Inquiry*, Vol. 93 No. 4, pp. 852-876.

Pastor, M., Sadd, J. and Hipp, J. (2001), "Which came first? Toxic facilities, minority move-in, and environmental justice", *Journal of Urban Affairs*, Vol. 23 No. 1, pp. 1-21.

Patterson, E.J. (2013), "The dose-response of time served in prison on mortality: New York state, 1989-2003", *American Journal of Public Health*, Vol. 103 No. 3, pp. 523-528.

Pellow, D.N. (2017), "Environmental inequalities and the US prison system: an urgent research agenda", *International Journal of Earth and Environmental Sciences*, Vol. 2 No. 2, pp. 140-141.

Perdue, R.T. (2018), "Linking environmental and criminal injustice: the mining to prison pipeline in Central Appalachia", *Environmental Justice*, Vol. 11 No. 5, pp. 177-182.

Perdue, R.T. (2023), "Trashing appalachia: coal, prisons and whiteness in a region of refuse", *Punishment & Society*, Vol. 25 No. 1, pp. 21-41.

Perdue, R.T. and Sanchagrin, K. (2016), "Imprisoning Appalachia: the socio-economic impacts of prison development", *Journal of Appalachian Studies*, Vol. 22 No. 2, pp. 210-223.

Pew (2016), "Justice reinvestment initiative brings sentencing reforms in 23 states", available at: www.pewtrusts.org/en/research-and-analysis/issue-briefs/2016/01/states-modify-sentencing-laws-through-justice-reinvestment (accessed 22 November 2023).

Prison Legal News (2011), "California prison officials pay $10,000 to settle prisoner's retaliation, conditions suit", available at: www.prisonlegalnews.org/news/2011/mar/15/california-prison-officials-pay-10000-to-settle-prisoners-retaliation-conditions-suit/ (accessed 19 April 2023).

Prison Legal News (2022), "News in brief", available at: www.prisonlegalnews.org/news/2022/mar/1/news-brief/ (accessed 19 April 2023).

Purdum, C., Henry, F., Rucker, S., Williams, D.A., Thomas, R., Dixon, B. and Jacobs, F. (2021), "No justice, no resilience: prison abolition as disaster mitigation in an era of climate change", *Environmental Justice*, Vol. 14 No. 6, pp. 418-425.

reRubber (2023), "Environmental impact of scrap tires", available at: www.rerubber.com/environmental-impact/ (accessed 31 July 2023).

Rios, V.M. (2006), "The hyper criminalization of black and Latino male youth in the era of mass incarceration", *Souls*, Vol. 8 No. 2, pp. 40-54.

Shammas, V.L. (2017), "Pains of imprisonment", in Kerley, K.R. (Ed.), *The Encyclopedia of Corrections*, Wiley, Hoboken, NJ, pp. 1-5.

Shenkin, E.N. (2021), "Prison abolition: justice and sustainable development through alternatives to the carceral state", in Filho, W.L., Azul, A.M., Brandli, L., Salvia, A.L., Özuyar, P.G. and Wall, T. (Eds), *Peace, Justice and Strong Institutions. Encyclopedia of the UN Sustainable Development Goals*, Springer, pp. 1-11.

Southern California Earthquake Center (2022), "Remembering the 1952 Kern county earthquake, seventy years later", available at: www.scec.org/article/823#:~:text=The%20Mw%207.3%201952,in%20the%20history%20of%20seismology (accessed 1 August 2023).

State of California Bureau of Audits and Investigations (2010), "Summary and analysis of the first 17 medical inspections of California prisons", available at: www.oig.ca.gov/wp-content/uploads/2019/05/Summary-and-Analysis-of-the-First-17-Medical-Inspections-of-California-Prisons.pdf (accessed 30 November 2023).

Stevens, J., Wagenfeld, A. and Toews, B. (2022), "From grey to green: guidelines for designing health-promoting correctional environments", in Moran, D., Jewkes, Y., Blount-Hill, K. and St. John, V. (Eds), *The Palgrave Handbook of Prison Design*, Palgrave Macmillan, London, pp. 623-656.

Syed, S.T., Gerber, B.S. and Sharp, L.K. (2014), "Traveling towards disease: transportation barriers to health care access", *Journal of Community Health*, Vol. 38 No. 5, pp. 976-993.

Sykes, G.M. (1958] 2007), "The pains of imprisonment", in *The Society of Captives: A Study of a Maximum Security Prison*, Princeton University Press, Princeton, NJ, pp. 63-83.

Taylor, D.E. (2023), "Prisons, jails, and the environment: why environmentalists should care about mass incarceration?", *American Behavioral Scientist online first*, doi: 10.1177/00027642221142206.

Toman, E.L. (2023), "Something in the air: toxic pollution in and around U.S. prisons", *Punishment & Society*, Vol. 25 No. 4, pp. 867-87.

Travis, J. (2005), *But They all Come Back: Facing the Challenges of Prisoner Reentry*, Urban Institute Press, Washington, DC.

Vogel, R.D. (2003), "Capitalism and incarceration revisited", *Monthly Review*, Vol. 55 No. 4, pp. 38-55.

Wacquant, L. (2002), "Deadly symbiosis: rethinking race and imprisonment in twenty-first-century America", *Boston Review*, Vol. 27 No. 2, pp. 22-31.

Wakefield, S. and Uggen, C. (2010), "Incarceration and stratification", *Annual Review of Sociology*, Vol. 36 No. 1, pp. 387-406.

Walkin' Steel (1991), "The proposed prison in Florence, Colorado: a 'new and improved' Marion", available at: http://freedomarchives.org/Documents/Finder/DOC3_scans/3.walkin.steel.Spring.1991.pdf (accessed 31 July 2023).

Ward Frampton, T. (2022), "The dangerous few: taking seriously prison abolition and its skeptics", *Harvard Law Review*, Vol. 135 No. 8, pp. 2013-2052.

Waters, M. (2018), "How prisons are poisoning their inmates", *The Outline*, available at: https://theoutline.com/post/5410/toxic-prisons-fayette-tacomacontaminated (accessed 31 July 2023).

Western, B. (2006), *Punishment and Inequality in America*, Russell Sage, New York, NY.

Western, B. (2018), *Homeward: Life in the Year after Prison*, Russell Sage Foundation, New York, NY.

Western, B. and Muller, C. (2013), "Mass incarceration, macrosociology, and the poor", *The ANNALS of the American Academy of Political and Social Science*, Vol. 647 No. 1, pp. 166-189.

Western, B. and Pettit, B. (2010), "Incarceration and social inequality", *Daedalus*, Vol. 139 No. 3, pp. 8-19.

Western, B. and Wildeman, C. (2009), "The black family and mass incarceration", *The ANNALS of the American Academy of Political and Social Science*, Vol. 621 No. 1, pp. 221-242.

Zenk, S.N., Schulz, A.J., Israel, B.A., James, S.A., Bao, S. and Wilson, M.L. (2005), "Neighborhood racial composition, neighborhood poverty, and the spatial accessibility of supermarkets in metropolitan Detroit", *American Journal of Public Health*, Vol. 95 No. 4, pp. 660-667.

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