# Readiness at what cost? Trauma, displacement and opportunism in the Florida Keys

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As more jurisdictions adopt climate and disaster readiness plans in response to disaster risk, the merits of climate resiliency, adaptation, and recovery processes and initiatives should be assessed based upon their outcomes as opposed to their stated or implied intentions. This should involve assessment of the experiences of early adopters, to assist localities with plans currently under development. The key question explored is what factors combine to exacerbate displacement risk in the long tail of a disaster aftermath, especially at the understudied intersection of political economy and disaster trauma? To address this question, I use in-depth interviews with residents of the lower Florida Keys in the aftermath of 2017's devastating Hurricane Irma, identifying a complex of drivers through which risk of unequal residential displacement took shape. Specifically, post-Irma bureaucratic delays contributed to trauma promoted displacement in local working communities; in some cases, these processes resulted from preparedness initiatives themselves. In addition to the well-known displacement that occurs immediately after a storm, this suggests that displacement risk may develop over long timeframes as residents are emotionally and materially worn down by repeated frustrations. Identifying how disaster readiness initiatives contribute to these processes emphasizes the need for enhanced attention to the places and populations that they are intended to protect, as well as the generative power of their interactions with everyday bureaucracy and government function. Furthermore, this community's experiences invite future research to better understand how resilience, adaptation, and public safety initiatives interact with political economic context in ways that can result in sociospatial inequality, providing caution and suggesting avenues for reform.

KEYWORDS

disaster, resilience, environmental justice, housing, qualitative, hurricane

## Introduction

Shortly after Hurricane Irma decimated many areas of the lower Florida Keys in September 2017, Bloomberg News characterized the area's post-disaster experience as the bellwether of "America's Great Climate Exodus" (Gopal, 2019). With climate change predicted to increase the severity of hurricane impacts (IPCC, 2014; Angus, 2016), social scientists have explored how political economic contexts influence planning, response,

and recovery (Tierney, 2007, 2015; Gotham and Greenberg, 2014; Dawson, 2017). The concept of community displacement has also gained center stage, with enhanced focus on why people remain or stay after a disaster. Important as these studies are, however, they tend to focus on disaster impacts in a few large cities, such as New York City's experience with Hurricane Sandy and that of New Orleans with Hurricane Katrina (e.g., Freudenburg et al., 2009; Adams, 2012; Gotham and Greenberg, 2014; Tierney, 2015).

They also tend to focus on the aftermath of disaster and to see pre-existing political economic context as the primary driver of vulnerability, occluding the ways that expectations of future environmental change may themselves change political economic context and disaster experiences (Pais and Elliott, 2008; Anguelovski et al., 2016). In this exploratory paper, I begin to address the need to better understand how the interrelationships among political economic, bureaucratic, and emotional stressors contribute to displacement, including stressors that result from disaster preparedness initiatives themselves. I do so through a case study of the lower Florida Keys' experience with Hurricane Irma, emphasizing the generative power of pre-disaster resilience planning in a relatively ideal test site: a small community with high disaster risk, an involved planning history, and elements of sociospatial inequality formation reminiscent of resilience gentrification (Gould and Lewis, 2018a; Shtob, 2022).

To analyze how sociospatial inequality develops, I synthesize the "production of disaster space" (Shtob, 2022) with literatures on natural hazards, displacement, trauma, and environmental justice. Building upon these literatures, I ask: how political economic and bureaucratic pressures, particularly those surrounding housing, real estate, and recovery itself, interacted with emotional trauma in the process of post-disaster recovery; how these combinations of political economic and emotional factors impeded attempts to recover and rebuild following Irma; and how together they may have promoted displacement of individuals and communities? The goal is to advance a synthetic approach to recovery analysis that admits a multitude of stressors and emphasizes their cumulative nature, rather than viewing each separately.

Results suggest that pre-existing bureaucratic practices made worse by the disaster, delays and frustrations with aid, insurance, and other elements of the recovery process, and disaster-related regulation combine to create pressing, long-term, post-disaster trauma that often exceeds the trauma of the initial event. In turn, this cumulation of stressors and trauma wears down residents in the months and years after a hurricane—well after most relief efforts have ended—creating susceptibility to displacement, often through speculative real estate pressure. In turn, this suggests that some common and intuitively reasonable bureaucratic and disaster planning practices may contribute to housing and community precarity, suggesting avenues for further study and eventual reform.

# Literature review

## Displacement, political economy, and emotional content of the disaster cycle

Population displacement is central to social science disaster analysis. While displacement and migration are sometimes thought to consist of unidirectional depopulation (Goodhue, 2018), organized managed retreat (Koslov, 2016), or officially-sanctioned abandonment (O'Neill et al., 2016; Flavelle and Mazzei, 2019), other studies hint that climate-related migration instead involves multi-directional churn: internal relocation, displacement, and external replacement (Fussell and Elliott, 2009; Curtis et al., 2015; Gould and Lewis, 2017, 2018a). Moreover, displacement due to economic circumstances and environmental risk is rarely fully compelled or fully voluntary. Instead, it involves a complex array of considerations that include affordability and distance from social support structures (Fussell and Elliott, 2009; Curtis et al., 2015).

For those in the "middle of the volitional continuum" between forced and voluntary migration, disasters can promote migration and displacement through complex combinations of structural and individual circumstance (Fussell and Elliott, 2009, p. 382). Building upon a decades-old social science interest in housing and displacement following disaster (Quarantelli, 1995) recent research has begun to explore these varied drivers and motivations. For example, an early piece (Levine et al., 2007) observed that we often focus on short-term relief to the exclusion of impediments to medium- and long-term housing recovery like fragmented or uncoordinated official response and the operation of legal and other structures that regulate recovery. More recently, McAdam (2020) emphasized the distinction between evacuation around the moment of disaster and the more arbitrary displacement that comes later while Essig and Moretti (2020) demanded greater anticipatory attention to causes of displacement risk. Rhodes and Besbris (2021) focus on a different element of pre-disaster planning, finding that among middle-class flood survivors in Houston eventual displacement is partially a function of pre-existing desire to leave or remain in the area. Conversely, however, there is the question of what happens in contexts where the desire to stay proves unacceptably onerous over the long term: in other words, what factors render this desire to stay more or less durable?

While recent efforts have explored possible factors like the effects of federal aid schemes on maladaptive post-disaster outcomes (Howell and Elliott, 2018), the same cannot be said for the displacement effects of everyday bureaucracies or many resilience initiatives. This hinders our ability to understand how the combination of ordinary government functions, extraordinary initiatives attendant to disaster, and their emotional consequences affects the desire or ability to stay. For example, Hunter et al.'s (2015) comprehensive review of the

climate migration literature highlighted the need for enhanced attention to inequality and structural political economy but omitted the question of how these interact with efforts to ensure more resilient futures. Moreover, its calls to highlight perception research and to examine long-duration community strain rather than exclusively focus on short-term relief stands in stark relief against the apparent absence in the then-existing literature of exploration of the full range of interactions among emotional, housing, and economic elements of displacement (Hunter et al., 2015).

Similarly, a recent review of the sociology of disaster literature called for additional studies of movement and displacement, as well as greater integration of disparate but related topics like mental health, housing, long-term approaches that include pre-disaster periods, the role of government beyond post-disaster aid regimes, and how decision-making strategies result in feedback loops that increase inequality and land development. Yet there is a notable absence of studies intended to disentangle these feedback loops by integrating pre-disaster adaptive strategies, emotional health, and the role of mundane government function like local housing bureaucracy and building codes (Arcaya et al., 2020).

This presents an opportunity to explore the emergent question of how the material and emotional content of post-disaster life may, in tandem, result in opportunism, the exploitation of disaster, or inequality formation. Disaster related displacement may operate similarly to green gentrification, as environmental amenities in the form of preparedness or resilience initiatives may be initiated due to the efforts of growth machine coalitions focused on real estate development that influence government decisions (Logan and Molotch, 1987; Gould and Lewis, 2017). Moreover, a green veneer may obscure the risk of inequality, displacement, and intensifying growth (Foster et al., 2011; Gould and Lewis, 2018a). Pais and Elliott (2008, p. 1419) consequently argued that disaster growth machine theory should explore how "struggles [over local development] change after a major disaster hits, as competing interests respond to opportunities created by the damage, displacement and rebuilding." Similarly, Gould and Lewis (2018b) demonstrated that on the Caribbean island of Barbuda post-disaster development decisions that carried displacement risk were recharacterized as more palatable relief or humanitarian efforts.

A complicating factor is that environmental justice analyses sometimes assume that disasters "land" on pre-determined sets of infrastructural conditions and social relations rather than contributing to their development. Studies that operate under this assumption run the risk of omitting the effects of disaster planning and response initiatives themselves (Klein, 2007, 2018; Tierney, 2007, 2015; Anguelovski et al., 2016; Dawson, 2017; Gould and Lewis, 2018a). In a time of rapid environmental change, viewing disaster planning not merely as derivative

of pre-existing conditions but as formative—and formative in distinctive ways—may provide insight into the unintended, unspoken, or truly unforeseen consequences of disaster planning (Shtob, 2022).

## Emotional and material links in the production of disaster space

The production of disaster space (Lefebvre, 1991; Shtob, 2022)—how our built and social environments are produced throughout cycles of disaster planning and response—provides a foundation for a synthetic approach analyzing how different political, economic, practical, and emotional factors might shape these consequences. According to Lefebvre (1991, 2003) space is produced at "the intersection of knowledge and power...[in ways] pertinent to those who wish to control social organization, such as political rulers, economic interests, and planners" and in turn reproduces the structures that create it (Gottdiener, 1993, p. 131). Because space and place are valued not only for their cash price but for their meaningful aspects like relationships among people, society, and landscapes (Greider and Garkovich, 1994; Gieryn, 2000), these are likewise relevant to spatial control through planning. While disaster zones are subject to the same political economic forces as any other, they are distinctive because of the risk of periodic destruction. Therefore, the planning elements of spatial production and resulting sociospatial control in disaster zones may also involve protective efforts, recovery, repair, and replacement. Additionally, disasters themselves can clear pre-existing structures without an assignment of blame to any human, obscuring political economic imperatives (Lefebvre, 1991).

The production of disaster space is similar to approaches focusing on the cumulative effects of concatenated crises (Gotham and Greenberg, 2014) but with a more explicit focus on disaster expectation and planning in addition to disaster response. With the number of resilience and preparedness programs rapidly expanding due to climate change and recognition of its cost-effectiveness (Colker, 2020), pre-event initiatives are of the moment and should be folded into our understanding of the political economy of disaster. One of the myths surrounding disaster (Tierney et al., 2006) may be the assumed win-win nature of these measures. Using the production of disaster space as a lever to question this myth provides an opportunity: because any municipal resilience efforts are in their early stages and there are emergent fiscal incentives for municipalities to get on board (Moody's, 2017, 2019; Omstedt, 2020), the question how the political economy of housing and displacement operates in often emotionally charged and traumatic disaster contexts deserves additional attention.

## Disaster, collective and cultural trauma, and environmental justice

One way to introduce the emotional content of disaster into housing is through cultural and collective trauma. While individual trauma involves a "blow to the psyche" (Erickson, 1991, p. 459–460) collective or cultural trauma typically develops from the loss of a sense of community or official support. Critically, it may impact those who did not experience the disaster firsthand but experienced its aftermath (Erickson, 1991, 1994; Alexander and Breese, 2011; Eyerman, 2015). Because space and social relations influence each other (Lefebvre, 1991), housing loss and trauma derived from failures in institutional response (Eyerman, 2015) are at the core of disaster experiences. Therefore, it is reasonable to expect that trauma may result from, and contribute to, the production of disaster space through housing and a sense of inequality formation after a disaster (including a sense of basic, disadvantageous unfairness in policies and procedures).

Accelerated environmental risk and injustice like accelerated landscape development, unequal accumulation of wealth, and increased residential instability all are associated with disasters, sometimes through planning and recovery schemes overlaid on pre-existing structural inequality (Elliott, 2015; Elliott and Clement, 2017; Elliott and Howell, 2017; Howell and Elliott, 2019). Yet questions remain about *how* many disaster preparedness and relief efforts fuel inequality formation (Howell and Elliott, 2018; Klein, 2018) through legislative, bureaucratic, and landscape development practice (Pellow, 2000). Critical environmental justice studies—a more recent evolution—advances these questions by asking whether the state is necessarily an ally in environmental justice efforts and by reminding us that all people are "indispensable to our collective futures" *in place* (Pellow, 2018, p. 26).

Displacement, even that which occurs in the middle of the volitional continuum (Fussell and Elliott, 2009), is implicated by each approach. First, disaster-based displacement threatens indispensability because it involves relocation that is often not fully voluntary. Second, it involves analysis of past, present or future government action, including seemingly neutral or prosocial activities that produce space in unequal or unjust ways. The idea that disaster trauma may result from disappointed expectations about recovery rather than from the storm experience itself (Eyerman, 2015) emphasizes the need to reconsider a variety of government and private aid and resilience programs, how they may create or support individual or community trauma, and how in combination these may result in displacement and associated environmental injustice. Drawing together the emotional content of disaster aftermaths with practical considerations involving insurance, aid, rebuilding bureaucracy, and preparedness regimes, I introduce a new exploratory synthesis of how these potentially mutually influencing drivers of displacement and environmental injustice that unfold in long-term post-disaster recovery. Put simply, the goal is to use the production of disaster space—the ways that we build around disasters in line with human priorities—to more broadly integrate potential drivers of displacement that rarely have been addressed in concert.

## Methods

In order to understand the intersection between the production of disaster space, political economy, disaster trauma, housing displacement, and environmental injustice, I used the lower Florida Keys as a case study (Yin, 1994, 2003). My data collection strategy was inspired by contemporary grounded theory (Charmaz, 2006) as well as the theoretical reevaluation and reconstruction suggested by Burawoy's (1998) extended case study method. The central element of this data stream was twenty-two in-depth interviews conducted in person and less often by telephone between 2018 and 2019 with residents of six separate islands in the lower Florida Keys ranging from Key West to the southwest to Big Pine Key to the northeast. Every participant lived in the area prior to Hurricane Irma, had personal experience with the storm aftermath, and at the time of their interview had been resident between 5 and 48 years. The participant pool featured members who were retired, actively working, year-round residents, seasonal residents (or "snowbirds"), at least seven who were dispossessed from their house for more than a year and a half, three who no longer lived in the Keys because of Irma, and a few others who at the time of our conversation were considering leaving due to Irma's aftermath. It was evenly split between men and women, with ages ranging from 31 to 87 and a median of 54.5. Housing experiences in this group varied significantly; while everyone reported being affected by Irma, some only suffered superficial damage while others returned to complete destruction.

In order to identify people with both strong local ties and personal experience contending with Irma, participants were initially recruited through community service organizations and related key informants. Thereafter, recruitment continued *via* snowball sampling, including strategic oversampling of those especially active in the community or with a breadth of community connections. With one exception all interviews were all an hour or more, with some exceeding 2 h. Initial questions asked about personal beliefs and demographics, as well as how participant ended up in the area. From the outset, relationships between housing and population displacement appeared to be important so a second set of questions focused on past, present, and future housing circumstances as well as observations about neighborhood shifts after Irma. Being conscious of the somewhat unique relationships that Keys residents have with place, a variety of questions focused on place relationships and how these interacted with the long-term disaster experience. Finally, a variety of questions focused on the

Irma and its aftermath, inviting free responses about factors that helped or hindered recovery.

Many questions were open-ended and intentionally vague, which allowed participants to answer them as specifically as desired. This prompted them to provide their own definitions for concepts as diverse as their community or communities, environmental change, recovery, and expectations for the future. In this way it tested salience of ideas and concepts and promoted ideational and thematic development, allowing participants to highlight issues and stories that they felt were most relevant, rather than limiting its scope to a predefined list of research topics. One result of this is that many participants framed their responses as pre-Irma and post-Irma observations, experiences, and opinions: Irma served as a catalytic socioenvironmental moment. Another was a pivot in topic from one focused primarily on the political economic roots of displacement to one that embraced the relationships among emotional trauma, things like housing and building codes, and bureaucracy.

During the coding process attention was paid to the development of novel categories, as well as general content of each category and stories that might represent potential outliers. While originally about 14 coding categories were contemplated, by the end of the coding and recoding process 20 often-overlapping categories were established. To be clear, these codes likely represent neither a full inventory of every factor that is play in this community nor every opinion held by residents. Moreover, an exploratory study focused on the relatively unique environment of the lower Florida Keys cannot inventory every concern held by the diverse array of communities preparing for disaster. As Burawoy (1998, p. 17) reminds us, "most communities are so riven by conflicts that it is impossible to navigate them to everyone's satisfaction no matter how careful the observer." However, by using the case study method and triangulating a variety of data sources, it is possible to capture a variety of thematic elements relevant to local recovery. Taken together, these themes were intended to provide guidance about ways to ameliorate maladaptive entanglements between housing, displacement, post-disaster trauma, and political economy.

## Results and discussion

After a brief discussion of people and place in the lower Keys to introduce economic and housing pressures that existed before Irma, I outline some instances of Irma related trauma that originated not during the storm but through the management of its aftermath. The connectedness between trauma and housing allows us to connect the emotional content of disaster (Erickson, 1991, 1994; Eyerman, 2015) with political economy and environmental justice. I then argue that, in addition to the well-known displacement that occurs immediately before and after storms through evacuation and housing damage, there may

be a brand of displacement that occurs over longer timeframes as residents are worn down by bureaucratic disappointment. This appears to be the cumulative product of regular bureaucratic ordeals transposed onto the difficulties of housing recovery after a disaster and exacerbated by housing policies focused on disaster preparedness in this highly vulnerable, early-adopting island chain.

To illustrate the potential, unexpected contributions of preparedness and public safety initiatives, I briefly outline two examples: the 50% Rule, part of a hurricane-resistant building and reconstruction code; and the Rate of Growth Ordinance (ROGO), a population growth limitation intended to ensure effective evacuation. In combination, the accounts to come suggest a new model in which less affluent community members experience the risk of displacement due to continuing and compounding frustrations with the process of recovery, while wealthier people are able to pay for convenience as they build back bigger. This combination of pressures wears down some dedicated community members, convincing them to leave well after the disaster event. For others, it creates significant questions about their willingness to suffer through another recovery, emphasizing the effects of concatenated disasters. Finally, I turn to a discussion of the real estate speculation that is common in the Keys and believed to have accelerated following Hurricane Irma, intensifying building development, diverting it toward tourism and temporary rentals, and possibly taking advantage of the bureaucratic grind experienced by residents. These observations suggest that long-term emotional trauma can serve real estate investment interests to the detriment of existing communities.

## The lower Florida Keys: Place, political economy, and precarity

Starting off, it may be useful to frame participants' relationships to place and emergent threats to place that predated the storm but seem to have intensified afterwards. Participants nearly universally liked their birth or—much more often—adopted home in the lower Keys. Most participants reported that they had been attracted to this subtropical island chain uniquely connected by a single road to the U.S. mainland due to some combination of sunshine, water, and recreation. A common story was that participants came on vacation, fell in love with the area's environmental amenities, and decided to move in.

Participants cited the cost of living as a trade-off for living in the Keys. The area is expensive and recently, increasingly so. Second jobs and side hustles, particularly in tourism, seem to be the norm for younger working people and even some retirees reported working to make ends meet. Nevertheless, most participants reported strong satisfaction with their community.

It was nearly universally described as laid back and often as having a friendly, caring, and helpful small-town atmosphere. Yet this was countenanced by concerns about long-term real estate development trends, as well as conversion of previously affordable residential areas to expensive tourism and vacation rentals that detract from the sense of community while driving the area's economic engine.

In the words of a retired businessperson and snowbird who split her time between a home up north and one in the Keys:

> [The] most important things [in local history] are bad things....They're mostly the tourist development. And it's just too fast and too much and too much money....We once had a home [up north] and it's the same thing: the little cottages and the farms get bought up by people with more money than they knew what to do with and...because your taxes went up so high, you can't keep your farm and you sell out to somebody that builds a McMansion that they live in two weeks out of the year and...the whole character...changed.....And of course after the hurricane that's worse [and it's] just overall overpopulated way too much, way too soon. And now with the destruction and the opportunities for more development I think it's going to get worse.

Part of her dismay was related to a strong sense of community: her house was completely destroyed by Irma and she appreciated the community she discovered thereafter, with neighbors pitching in as she rebuilt. Like others, she was concerned about how this economic squeeze would impact the local sense (or existence) of community. This includes a common thematic concern about whether the area's affordable housing stock is sufficient for local workforce needs. A minority of participants disagreed. They saw tourism development as the natural and beneficial outcome of the Keys' growth trajectory. A real estate professional active in local tourism promotion opined:

> Yes they were trying to do a lot, mainly tourism... to keep the Keys stable financially. Because it is truly the tourism [that] pretty much runs the economy there and without the tourists coming it's a domino effect....If they don't have the tourists they don't have the people to run the restaurants and stores and shops and if we don't have that, then the people have to leave because they can't get good jobs.

That she lost her home to Irma and left the area due to difficulties with recovery underscores the complexity of participants' relationships with these issues. While most people expressed concerns about the accelerating rate and intensity of development, many either discovered the Keys as tourists or were wholly or partially dependent on tourism for their livelihoods. The conversation about loss of place and community was usually less about whether tourism should continue and more about how tourism affects housing and cost of living, as well as how symbolic battles about tourism reflect the greater question of "who are the Keys for?" This pre-existing sense of precarity was described by participants as intensifying due to Irma, as the process of place conversion accelerated.

## Trauma machines: Storm aftermaths, housing, and rebuilding

All participants spoke about the trauma experienced during and after the storm, either personally or by reference to others. In nearly every case it was related to housing, bureaucracy, and the stress of rebuilding. Yet there was a qualitative difference between the short-term trauma of confronting the storm itself and the cumulative trauma arising while confronting the long grind of rebuilding and bureaucracy: acute yet short-lived trauma was experienced initially, yet a more onerous, chronic form of trauma appears to have developed thereafter. For this reason, I begin by outlining the phases of disaster trauma described by participants, as well as their sources.

## Short term: Irma, evacuation, and early returns

The first moment of stress described by participants arose as Irma approached, businesses and workplaces shut down, and evacuation orders were issued. Many struggled to find a place to go, especially with much of Florida at risk. Despite these hardships these stories were generally jovial. Many participants felt that hurricanes were just part of local life and while evacuation was inconvenient and exhausting, it was not intensely traumatic. To the extent that accounts of this period involved stress it tended to arise from practical issues like the desire to not impose as a long-term houseguest or finding fuel on the road. Despite stress and difficult choices, these stories carried a significantly more positive attitude compared to those that came later. For long-term residents, part of this seems related to experiences with past hurricanes, which were milder than Irma. These cultivated a hopeful sense that Irma would be more inconvenient than tragic.

There was no lived precedent for the scale of destruction that participants encountered when they returned weeks after evacuation, and the tone of rebuilding stories turned quickly away from jovial. Accounts of the moment of return and absorbing the extent of the aftermath and recovery to come became especially ominous in connection with mental health. One participant who suffered minimal damage to his own residence but helped others' recovery expressed sadness seeing debris piled high on the roadsides: tangible reminders of destroyed housing scattered across the landscape.

Before the hurricane, I was pretty much happy all the time. [The Keys were] uplifting and laid back and comfortable. I will tell you that since the hurricane it had a profound effect on my psyche....I'm a member of Alcoholics Anonymous. I've been sober for [decades]. And right after the hurricane, I went to meetings twice a day for six weeks. Now, in normal time...I only go to AA meetings once or twice a week. But right after the hurricane, I needed structure...and I needed a place to go and be able to talk to people and commiserate and cry. Because it was utterly depressing.

Even those who were spared the worst of the storm reported an empathetic shock those first few months. Those who suffered significant housing damage, however, focused on the emotional consequences of the cleanup. One homeowner in his 60's who lived in a camper outside of his house while repairing and cleaning up described "Irma zombies" that resulted from the overwhelming scale of destruction and realization of the long-term nature of recovery:

Just the work that we put in right after the hurricane...cleaning up. I mean, it was just...12 hours a day and just working straight in the heat, and it was hot. You hear people call it...Irma zombies, you're an Irma zombie because [you]...just don't know what to do. I mean there was just so much stuff to do that we couldn't do it all.

Stories of immediate post-disaster sadness, while common, were typically mixed with praise for volunteer efforts and deep appreciation for the swift influx of charitable, individual, and community aid. Accounts of the period immediately after the storm, therefore, indicate a time that was bewildering and overwhelming, yet for many still served as a comparatively hopeful prelude to periods to come.

## Medium term: The frustration of recovery and rebuilding sinks in

The next stage—grappling with an extended reality of disaster that persists long after many emergency responders and aid organizations have departed after the initial weeks and months—sees the intensification of viscerally traumatic reactions (Erickson, 1991; Eyerman, 2015). Critically, the centrality of housing in these accounts strengthens as time wears on. Participants commonly began to identify human culprits when discussing this stage (as opposed to the anthropomorphized Irma), including local government, banking and insurance entities, and various opportunists who they believe preyed on economic and emotional vulnerability. Yet when describing the immediate aftermath, first responders who had worked in difficult conditions were usually praised

regardless of the effectiveness of their efforts. In short, it is important to read these accounts not as blanket condemnations of government, government workers, or government efforts, but rather pointed criticisms of specific institutional practices.

One central thematic element at the intersection of housing and intensifying trauma was disappointed long-term expectations of recovery: a mismatch between the expected recovery time and reality (Eyerman, 2015). After feeling a short-lived sense of relief when aerial photos of his neighborhood were finally released well after Irma, one participant recounted:

I looked down and there was a roof [on my house] and I said, well, there's something to come back to, and we were pretty excited to say, take a pressure washer, we'll wash out the house, we'll chuck the sheet rock and get started. But then when we walk in the house and inside the house were things that were my neighbors', that's when I was like wow, this is too much. I thought we'd just clean it up in a week or two. And I was pretty positive...but when you work ten days and you're only six feet in the door. And it was hot. Brutal....And you realized as you drove back and forth around town that everybody was all messed up in some way. It was pretty rough. It certainly, instantly went to depression after about four weeks, and then I think now looking back on it I think everybody...has PTSD. I know I do....It's so frustrating that there's so many suicides happening, there's a lot.

Like the Irma zombies, this underscores how the initial hopefulness of recovery turned to bewildered resignation over time.

Many participants described a mismatch between actual recovery time and what is assumed by aid agencies. For example, while reflecting on the stress experienced by many who were returning to no place to live, no job, and possibly a fractured community, one participant commented:

Well, they knew they were coming back to nothing, right? And...the worst part of it is for some reason, when you're in a disaster, their limit is three months, right? They give you three months of help, and then they think we're out of here. So everybody left, the churches left, the Salvation Army was out of here. They were here for the most intense part, which was just coming back in. But after three months...everybody left. The tents went down.

This feeling of abandonment were compounded by feelings of being ignored and preyed upon. Participants bristled at a perceived preference for Key West tourism over the needs of residential areas, including greater commitments of resources and much faster cleanup in tourist centers. Many resented how their damaged homes were treated as spectacles. One complained about scrappers rooting through his possessions, taking anything of value, and leaving a mess for residents to

clean or face fines. As the extent of the aftermath and recovery exceeded expectations, resentment about outside involvement began to grow. Cultural trauma was forming.

## Long term: A traumatic slog through bureaucracy

### Housing delays and building codes

Why did long-term trauma develop in this way among these participants? One reason is the exhausting reality of being displaced and unhoused or underhoused. Among the participants were many who used or borrowed campers for temporary shelter, stayed with friends or family for long periods, moved away, or who were still experiencing precarity or substandard housing a year or more after Irma. One participant could see through the front and back walls of his house: he called this his air conditioning. Another described his illegally parked trailer that lacked potable water or a working toilet as the one you get when FEMA rejects your request. He also feared the county would discover and evict him, forcing him from the area. Those who were displaced or living in a damaged structure commonly reported the traumatic effects of recovery delays. Many reasons were cited for these delays, each of which was sufficiently common among participants to suggest that a complex of interrelated and identifiable sources of frustration, disappointment, and fear arose after the storm.

The first and most common theme involved frustration with local government bureaucracy, specifically with building codes, inspections, permitting, and other requirements. Outside of disasters, it has been suggested that "building code violations are likely to burden and punish poor homeowners who cannot afford the required repairs and to hurt poor renters who cannot afford the higher rental prices charged by landlords who pass on the costs" (Bartram, 2019a, p. 942). The literature likewise suggests that the aggregate impact of building code enforcement tends to support the interests of speculative growth machines to the detriment of those less financially able to quickly remediate issues (Bartram, 2019a,b).

Building codes and disaster have co-evolved: "building codes, as a general rule, followed disastrous fires, becoming more refined with each one" (Davis and Ryan, 2020, p. 212). They therefore combine to produce space in anticipation of risk, creating impacts (intended and unintended) during recovery (Shtob, 2022). Coupled with pre-existing antipathy toward county building code enforcement due to perceived overreach, there was an overwhelming sense that post-Irma permitting and enforcement were central factors that exacerbated post-storm trauma. This risks realizing what Blomley (2020, p. 5) calls "precariousness in property law," meaning "the work that [real] property does in structuring asymmetric relations of vulnerability and privilege."

While strong dissatisfaction with local housing bureaucracy preceded Irma, participants reported that the new hurricane-resistant building code—as well as a disaster preparedness element colloquially called the 50% Rule—foreclosed the opportunity to rebuild for many. Under this rule, the owner of a destroyed modest or mobile home must rebuild to the new code, including potentially elevating the home on concrete stilts or a soil mound. While old buildings do not have to be renovated to the new code, this changes if they are substantially damaged (meaning, at risk of oversimplification, that repair costs exceed 50% of the structure's preexisting market value). Beyond topography and weather, one unique thing about the Keys is that a significant portion of the population is familiar with building code minutiae. Nearly everyone knows the 50% Rule. This illustrates how the combination of pre-existing institutional structures like bureaucracy may combine with disaster preparedness initiatives in ways that can exacerbate frustrations and trauma.

While the county independently adopted this rule, its published communications are careful to state that its purpose is to ensure future flood insurance in the area from the National Flood Insurance Program (NFIP) (Monroe County, n.d.-b). Although it is a positive sign that the county takes the NFIP flood requirement seriously, it is not without consequence. The 50% Rule can be especially destructive to those living in ground level homes, especially mobile homes. In many cases "mobile" is a misnomer because these homes deteriorate over time, may be impossible to move without breaking apart, or may require relocation by flatbed truck at unaffordable prices. In many cases, residents own the home itself but rent the pad on which it sits. When a mobile home park closes, residents may therefore lose their homes and their investment based on the park owner's decision (Sullivan, 2018).

Participants described a similar process for mobile or modest ground level homes that were damaged in Irma. Because of their limited value and the high cost of construction after the storm due to limited availability of contractors and high material costs, the cost of repair could easily exceed half these homes' value, triggering the 50% Rule. Yet building to the new code may be impossible for those without insurance or substantial savings. Even for those with insurance, proceeds may be insufficient to rebuild because insurance is keyed to the lower value of the preexisting damaged home.

According to participants, this process forced many working- or middle-class residents to sell their lots for whatever they could get. In turn, this primed the area for speculative purchases of many buildable lots for development into vacation, tourism, or seasonal rentals, intensifying land use and fomenting displacement. While the effects of the 50% Rule usually apply to more modest houses, this is not always the case. One participant—a successful entrepreneur and community booster who lived in an enviable home on the water—chose to leave the Keys after her house fell under the 50% Rule and her

insurance refused to pay the full rebuilding cost. Part of the issue, she explained, was the cumulative effects of struggling to hold on through disappointment after disappointment: when the insufficient insurance check arrived after over a year after Irma it was the final straw. She could have continued fighting but was too worn down.

Codes and permitting—which bestow the legal right to rebuild—gained special significance for participants due to the scope of destruction and entanglement with trauma. To illustrate the many stories that laid mental health issues at the feet of bureaucracy, one participant related his astonishment at a well-known story of a murder-suicide that occurred after the decedent couple went to a county meeting looking for help that was not forthcoming.

> What you found that's strange in the Keys was…in the Keys we're happy people, easy go lucky…and everyone takes everything in stride. People live down here without air conditioning and they're thrilled. They don't go 'woe is me.' They go 'look at me, I'm living the dream.' And for them to pull the trigger, is stunning. And the people who did it, you're like what the heck, they were doing good and on their way back to rebuilding and…just got a new job and he killed his wife and himself. Holy crap.

When asked what might have contributed, he outlined the tenor of local bureaucracy and its associated inconveniences.

> I have an answer, personally for me it was permitting, [the county]….Oh, absolutely. They have made it so difficult to rebuild, incredibly monumental incompetence in the…building department. Not by the inspectors, but the people who run the department are incredibly incompetent. And you…make seven trips up here, just to turn in an application, and each time you go you get told a totally different thing, that's a 45 minute drive, and some people have to work five days a week so they only get one shot….And then they get told if you didn't record this at the records office and we got to go to the records office and the records office says we don't need a copy of that, we need a copy of the other thing, and they send you back to them and they tell you sorry I meant to tell you this one, and then you gotta go back to the records office, back and forth….

Participant accounts like this were supported by media reports stating that the area's already high suicide rate doubled in early 2018 and that these mental health effects only emerged after a honeymoon period of community togetherness (Klinenger, 2018).

This participant, like others, is careful to not blame any individual, instead focusing on the systemic frustrations arising from the bureaucracy through which decisions were made. Indeed, there was little participant support for a *laissez faire* housing free for all, without things like building codes,

enforcement, or hurricane preparation. Unsurprisingly, people who have experienced a hurricane the size of Irma tend to support involved preparedness initiatives. Participants were less enthusiastic, however, about other effects of institutional resilience bureaucracies on their communities: implementation of the rules was the issue, rather than their wisdom. This suggests that the production of disaster space engenders multiple competing commitments that must fretfully coexist under the logic of resilience and public safety.

Many shared a tacit understanding that their frustrations do not apply to those with the means to hire professionals to deal with the paperwork and administrative requirements, especially for second or vacation homes that they did not need to occupy while rebuilding. A number of participants shared the wisdom of hiring private insurance adjusters, building code compliance inspectors, or contractors who would deal with the bureaucracy for a premium. This is similar to Tierney's (2015) observation that Hurricane Katrina survivors were required to take an entrepreneurial approach to disaster relief, advocating for themselves in order to be considered "worthy" of relief and aid. While these examples of the neoliberal "privatization of recovery efforts" expose how disaster recovery systems can support inequality by directing aid toward the already wealthy or entrepreneurially sophisticated (Tierney, 2015, p. 1338), opinions in the lower Keys reveal another facet.

This implicit requirement directs that individuals either hire expensive professionals or operate as skilled and patient bureaucrats, deftly and repeatedly navigating time-consuming, complicated, and frustrating administrative requirements. Indeed, the participant who was most sanguine about recovery reported getting ahead of the bureaucratic morass as a likely reason. For many, the consequences for failure are homelessness or displacement from the area. Some participants alleged intentionality in how permitting and code enforcement took place after Irma. They argued that the slow pace was intended to let houses mold and rot so they would be easier to condemn, bulldoze, and replace. To them, officials were expressing a preference for more substantial, and expensive, structures.

While proving or disproving intentionality is likely impossible, the imposition of bureaucracy through local permitting was a central factor in the development of cultural trauma: a sense of the failure of government to uphold the covenant to protect the public (Eyerman, 2015). Many participants felt abandoned or that there were active efforts to get rid of them by making a bad situation unbearable: they felt dispensable (Pellow, 2018) and in part this was due to rules intended to protect against disaster. Moreover, while participants typically were pleased with private, charitable efforts to assist, the same cannot be said about their interactions with insurers, mortgage banks, and official or quasi-official organizations that were tasked with post-storm assistance. Intriguingly, participants almost universally expressed support

for building back stronger—often motivated by the scale of Irma's destruction and cleanup—even while they decried the uneven nature of building code impacts.

## Other contributors to cumulative bureaucratic trauma: Aid, insurance, and banks

Other prevalent themes focused on different elements of bureaucratic frustration, emphasizing that it involves multiple sources that interact with, but are not necessarily dependent upon, hurricane preparedness initiatives. One was a complaint that FEMA and other official sources of aid offered, in the words of one participant, "a false sense of security, a false sense of hope." Many participants related stories of waiting in the heat outside FEMA tents to apply for aid and a litany of frustrations including: insufficiently trained aid workers; temporary housing being issued haphazardly or at great distance; protracted fights over denials; and eventual assistance falling far short of what was needed and promised. Some participants said that if they experienced another hurricane they would not bother applying.

Many participants cited lack of communication and cooperation from insurance and financial institutions as additional sources of delay and frustration that exacerbated housing worries. For many residents, repairs could not begin without insurance and mortgage bank approval, so drawn-out process of haggling and denial became symbols of traumatic inertia. These frustrations also include the inability to find licensed contractors once insurance money arrived. Delays in insurance adjustment and payment meant that those who could afford to self-finance repairs were first in line. Those who depended on insurance often waited months and, in some cases, more than a year to simply *find* a contractor, even after insurance issues had been resolved. Some participants reported undertaking repairs themselves—if they had relevant construction skills—or going to extraordinary lengths to obtain help. Another complicating factor for those with mortgages is that insurance proceeds were sometimes held by their financial institution until they demonstrated proof of repair (i.e., progress payments), adding additional time and headaches and again providing reasons for contractors to prioritize those paying cash.

Some who suffered minor damage reported little friction with their insurance company yet others avoided contact with insurers by not filing minor claims or hiring private adjusters. Others reminded me that it is nearly impossible to adequately insure a mobile home, compounding the special precarity of manufactured home residents. Legally, mobile homes are often treated as personal property like automobiles and consequently are subject to different financing and insurance regimes than real estate (Sullivan, 2018). Accordingly, insurance adequate to rebuild to code may be unavailable for much of the area's working-class population. Although opinions about the insurance and mortgage process did vary somewhat, an important theme is that the bureaucratic runaround combined with various legal regimes contributed to an uneven terrain of housing recovery differentiated by wealth.

In total, the process that ground down less affluent homeowners started with the need to rebuild to the new, hurricane-resistant code. For some, that was end of the road: they were simply unable to repair based on a lack of funds and insurance. For those who committed to rebuild, delays resulting from building code and reconstruction bureaucracy were exacerbated by the need to satisfy insurer or the mortgage bank requirements, and finding contractors who would work on credit with others offered cash in hand. This added additional steps, expense, and delay to the process of recovery; the absurdity of this process led to one participant opining that "all insurance is a scam."

These themes represent a variety of factors—bureaucratic delays impeding rebuilding, consequences of a building code preparedness initiative, insurance and banking delays, and aid that promised more than it delivered—that may promote displacement over the months and years following a storm by generating continuing trauma, and caused participants to question whether they would have it in them to stay through another hurricane and recovery. This cumulation of frustration is sometimes missed in event-focused disaster studies: one exhausting, disappointing, and unfulfilling recovery may fracture the desire to stay through another. This suggests that the study of disaster displacement may benefit from a long-term view that combines observations about the durability of a pre-existing desire to stay (Rhodes and Besbris, 2021) with trends across multiple events (Gotham and Greenberg, 2014).

## "Geography and money": Mechanics of speculative investment and complex displacement

It is unsurprising that hurricanes can be traumatic. Among these participants, however, the cumulative complex of administrative and bureaucratic delays and frustrations seemed more traumatic than the storm experience itself. While they expressed some fears developed from the storm event—and everyone said that they would follow the next evacuation order—it was the grinding weeks, months, and in some cases years of cleanup, rebuilding, uncertainty, and precarity that suborned the greatest sense of trauma. Triangulating participant accounts with county explanatory documents, local newspapers, and conversations with local experts reveals another angle: longer-term housing trauma and traumatic displacement may be the result of, as well as promote, speculative investment that continues the cycle of disaster and displacement.

Rather than a linear "great migration" away from risk, displacement in the Keys is better understood as out-migration, in-migration, and a significant but underexplored process of migration within: local population churn that also carries risks of substandard housing or constructive homelessness (Fussell and Elliott, 2009; Curtis et al., 2015; Gould and Lewis, 2017, 2018a). Whatever its precise form, participants reported that the hurricane, displacement, and the official response reproduced and intensified an overall development trajectory toward wealth and tourism in the lower Keys.

In addition to the 50% Rule, another hurricane preparedness initiative that appears to have contributed to displacement and turnover in favor of tourism and speculation is the so-called Rate of Growth Ordinance (ROGO). It traces its lineage to a statute passed in 1972 to limit development in the Keys and informed the 1986 Monroe County Comprehensive Plan (Monroe County, n.d.-a). A limitation of building rights—ROGO rights are required to build new residential or tourist structures—its purpose is to restrict population growth to ensure timely hurricane evacuation on the single road to the mainland. Its allocation formula uses a complicated system of tiers with their own structure, as well as a scoring system that accounts for land dedicated to the county, aggregation of plots, and donation of funds to retire existing development rights (each of these is intended to reduce overall growth pressure). Approval for one of the limited allocations may take years and may prioritize those with the means to buy multiple plots for aggregation or dedication, or to donate cash (Monroe County, n.d.-a).

Like the 50% Rule, however, it may provide incentives for the conversion of affordable housing to expensive housing and resort development and this may be exacerbated by hurricanes. This is because the ROGO development rights attach to plots of land but are also tradable: a plot owner can sell them and they attach to the purchaser's plot. In practice, this means that rights previously attached to affordable housing may be sold to developers of larger projects. In the words of one resident:

> In the past there was housing, more housing available to the lower class. And that lower class [who work at the supermarket] and you know, places like that…that needed…low-income jobs and so they supplied those. Like the trailer park…on Big Pine Key, which…three years ago now…was destroyed…basically about 150 trailers [of] affordable housing that were destroyed.…They came in…and bulldozed all the trailers down and people either got given a bus ticket to get out of the Keys [or] some of them were really relocated. And…these development rights went to a condo that they were building [near Key West]. So, you know, those type of things keep happening where…these low-income transient rentals' [ROGO rights] are being bought up and moved. And hence, housing…was lost for the lower class. And then Irma basically took it to another level because…a lot of these other trailers had

enough damage that they could not be repaired and they would have to be replaced by a single family residence.… So that's…out of the price range for many of these people.

This suggests that the ROGO system and the 50% Rule contribute to a conversion of available working-class housing to more expensive forms, even though the ROGO statute does conceptually address affordable housing. This likewise represents the conversion of the post-disaster ability to remain in place into tradable real estate investment. While this process did not begin with Irma, it appears to have accelerated after. It also reflects concerns about the bureaucratic grind that residents had to endure. If unrepaired, a significantly damaged structure and its lot might be condemned, and condemnation threatens a loss of the property's ROGO rights.

The ROGO system represents another well-meaning regulation that was enacted for the purpose of hurricane safety. The popular and economic appeal of efforts like this is emphasized, if by nothing else, by the fact that the entire participant pool—even those most critical of the official response and most concerned with its embedded unfairness—supported official hurricane preparedness and safety interventions. Yet like building codes, the 50% Rule, and the related bureaucratic morass, the ROGO system also has the potential to impact affordable housing and, consequently, displacement and community disruption.

While a precise legal analysis of the 50% Rule and the ROGO is beyond the scope of this paper, some observations about their perceived effects illustrate how institutional bureaucracy may combine with resilience or adaptive initiatives to promote recovery trauma and consequent displacement. This type of exploratory analysis in an early-adopting community may be especially important as more communities follow their lead. Moreover, they have distinctive logics and independent public safety justifications that distinguish them from typical green gentrification (Gould and Lewis, 2018a): they similarly operate within local speculative investment trajectories but focus on protection from nature rather than protection of nature.

A substantial majority of participants expressed concerns about the intensification of development after Irma, the loss of affordable housing (in the local parlance "workforce housing"), and the way speculative investment drove each. There was broad general agreement that amplified housing pressure due to real estate speculation priced out the vulnerable and exacerbated the precarity and trauma of recovery.

> Now I think…I wish they had better control over the overdevelopment.…I mean, growth is not a bad thing. You have to have growth, but a good pace would be better. I think that the hurricane itself…has opened the way for opportunists. There are a lot of people that are manipulating the system to work in their favor.

The battle over development also manifests in perceptions of official involvement that build off of bureaucratic and other delays that result in displacement. These accounts link generalized frustration with the county with a perceived preference for tourism development. In the words of one participant who suffered a complete loss of her home and business but was trying to rebuild nearly 2 years after Irma:

> Well, I've seen the continued proliferation of bad money winning out with development. You know, you can buy your way through things. I've seen it on my own street, and…it's very public, a lot of times….I have been at the mercy of the other end of it where…government goes for the low hanging fruit. Well, they got to do something and my…those people over there…they're easy pickings over there. Let's see what they got going on their property.

The outcome was that speculators were able to buy lots for inflated prices. Additionally, they may be able to overcome housing recovery issues less stressfully than the average resident who, through it all, needed a place to live and might depart simply to put a roof over their head if recovery was delayed beyond a breaking point. Another participant who lost her rental and had to live with friends for nearly a year after Irma said:

> Housing became ridiculous. People were ending leases just to take advantage of [that] …and they were doubling rent almost. So, it made it impossible to afford anything. I mean, for us to rent a house…the minimum was $3,000. More than one whole paycheck for me…but they did it to everybody. So…that was really frustrating. Or people were trying to sell homes… "as is," for $300,000 and half the house is missing. I mean, because there was nowhere to live…so just to see people trying to take advantage of that situation.

Importantly, "half the house is missing" implies damage so severe that in addition to the lot price rebuilding would likely require demolition and removal of the remaining portion, then construction of a wholly new code compliant structure. This expensive and time-consuming process is likely beyond the means of many working-class residents. Many participants connected this speculative conversion, long-term pressures on those who wanted to rebuild, and emotional trauma. One participant expressed concern with the long-term mental health effects of community disruption resulting from real estate market pressure and bureaucratic involvement.

> There was some help. But it was…a very fearful thing when you don't know if somebody is going to…take your property away from you. You know, we live very simply down here and most of the people were…retirement age. You just keep going…..It seems to me that there are a lot of situations [that] could have been reconstructed very easily without too much money and it seemed like…people [were]

thinking that they were going to get some financial help from the different agencies, but instead they condemned things. Instead of saying, 'well, this is really not as bad…maybe we could give you a little money'….Instead of that it was 'off with their heads'…and that's when people started to get really mentally sick from it.

When asked about what led to differences in disaster experiences, one participant's summary was "geography and money." Housing pressures got so bad after Irma that a primary topic of conversation—perhaps *the* primary topic of conversation—involved the fear that there were not enough workers to provide public services and work in tourism because they could not afford to live locally.

These discussions included descriptions of the need to bus resort workers down from the mainland or simply do without. The overwhelming use of the term workforce housing in many participant interviews, as well as in the media and government communications, suggests a certain working class precarity: rather than being indispensable (Pellow, 2018) less affluent inhabitants of the Keys are expected to serve some broader economic purpose. Yet hurricane preparedness initiatives traditionally have not foregrounded things like maintaining adequate housing over the long term. In fact, in some cases they appear to promote the opposite as they incentivize land use intensification for temporary or seasonal use.

This is likely a contributing factor both to local displacement and to environmental degradation: the creation of a system that indirectly incentivizes the replacement of modest, affordable residential structures with more expensive vacation structures. It illustrates a mechanism by which the production of disaster space can promote inequality through disaster preparedness efforts. Moreover, because these local rules and practices are developed in part from processes and efforts generalizable elsewhere (including NFIP regulations and standards and increased recognition of climate and disaster risk that invites response across jurisdictions), it provides a caution for later adopting coastal communities in the United States, especially as disaster planning gains salience.

## Conclusion

This exploratory paper presents a new way of examining relationships between disaster readiness and housing based on the experiences of an early adopting community. Although developed in a somewhat unique area that recently became one of the few to consider abandoning some areas to climate change (Flavelle and Mazzei, 2019), it suggests that after a disaster, cultural trauma develops over long timeframes from failures of bureaucracy, disaster planning regimes, aid systems, and insurance and financial institutions to serve community needs without needless frustration and delay. Over time, these failures

wear down elements of the population, rendering less affluent community members more likely to give up and leave and more susceptible to real estate opportunism. Yet we should not conclude that concerns about affordable housing are completely missing from the lower Keys, or that local government and public servants do not care. After Irma, initiatives to improve affordable housing to ensure a viable local workforce were implemented, although it is debatable whether they will be sufficient (Wadlow, 2018).

The production of disaster space factors heavily in both the need for workforce housing and the conversion from truly low-cost mobile homes to comparatively expensive "affordable" housing. Hurricane responsive building codes and standards such as the 50% Rule may risk removing low-income housing from the market, leading to speculation and consequent inequality. Likewise, the Rate of Growth Ordinance was passed in anticipation of a future hurricane, and similarly it provides incentives to remove truly affordable housing from the market. Taken together, these and other socio-legal structures like enforcement regimes contribute to an exclusive vision of the lower Keys, in which only those with sufficient wealth to withstand a hurricane will remain (along with those needed to provide services).

Each of these mechanisms also promotes the development of bigger, fancier, more expensive structures to serve as vacation or investment properties. Alone—and especially when combined with regularly onerous bureaucratic requirements— they contribute to the mental exhaustion and trauma cited by many participants that, in turn, may provide opportunities for predatory behavior, may wear down even those who are committed to remain and rebuild, and may discourage community members from deciding to endure another recovery. These may become worse when public risk governance regimes like building codes mix with private risk governance regimes like insurance and mortgage covenants. Poorly executed, these bureaucracies foment collective and cultural trauma (Erickson, 1991; Eyerman, 2015). By so doing, they appear to cyclically support displacement and the intensification of development in ways that might seem familiar to green gentrification scholars (Gould and Lewis, 2016, 2018a), yet with a focus on protective environmental amenities like resilience and adaptive systems.

Yet the literature also suggests avenues for reform. At least one modern infrastructural analysis of building codes and resilience emphasizes encourages the use of incentives rather than penalties (Davis and Ryan, 2020). Following this path may have promoted swifter, more productive interactions with code enforcement after Irma. This is especially important because of the risk of mold and continued deleterious effects of exposure to the elements if repairs are not prosecuted quickly. Moreover, it could be especially beneficial if it was coupled with a relaxed bureaucratic regime tailored to the post-disaster context through recognition that the primary short-term goal is to provide stable housing in place, as well as post-disaster case management system in which trained professionals help residents explore their options and navigate aid and bureaucratic regimes. It may also be worthwhile to extend the recognized public safety and aid window to many months or even years after disaster, reflecting common recovery times, as well as to pivot from an adversarial permitting relationship to one that specifically considers housing inequality formation (Pellow, 2000; Bartram, 2019a,b).

Although this study is exploratory and limited to a particular case and a particular context, it marries the material and the emotional, showing how they create mutually reinforcing cycles that catalyze disaster—or the anticipation of disaster through planning regimes—into consequences for housing and communities. At the very least, our efforts to ensure effective disaster recovery should recognize the connectedness of these factors across contexts. Because disaster preparedness and planning regimes are often developed with good intentions and may be amended with a stroke of the pen, reform developed from these suggestions is possible in the many places and jurisdictions—large and small—that live with the risk of disaster.

## Data availability statement

Subject to human subjects research confidentiality and other requirements, the deidentified raw data supporting the conclusions of this article will be made available by the author, without undue reservation.

## Ethics statement

The studies involving human participants were reviewed and approved by Research Compliance Services, University of Oregon. The patients/participants provided their written informed consent to participate in this study.

## Author contributions

The author confirms being the sole contributor of this work and has approved it for publication.

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## Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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