


RESEARCH ARTICLE



Remembering the Past, Anticipating the Future: Community Learning and Adaptation Discourse in Media Commemorations of Catastrophic Wildfires in Colorado

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ABSTRACT

Wildfire may be the clearest example to date of a socio-natural hazard that is being exacerbated by climate change, making wildfire an essential lens through which to investigate learning and adaptation in the Anthropocene. Here, we study discourse about simultaneous and recurring catastrophic wildfires in Colorado newspapers. We find that the wildfires' anniversaries served as opportunities for critical reflection on hazard causality and mitigation in local media, particularly the first anniversary and especially for a community that experienced two catastrophic wildfires in a row. Two mediated prospective memory practices—invoking hindsight as foresight and recognizing a new normal—contributed to this discourse. However, learning and adaptation discourse faded in local media at later anniversaries. These findings contribute to learning and adaptation scholarship by connecting the concept of mediated prospective memory to disaster-related media studies and attending to the intricacies of anniversary commemoration under circumstances of simultaneous and recurring disasters.

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Introduction

Wildfire is perhaps the clearest example to date of a socio-natural hazard that is being exacerbated by climate change (Liu, Stanturf, & Goodrick, 2010; Westerling, Hidalgo, Cayan, & Swetnam, 2006). Worsening wildfire trends might therefore be interpreted as a harbinger of the intensifying socio-natural hazards and increasing human vulnerability expected of the Anthropocene (O'Brien & Leichenko, 2000). In turn, wildfire is becoming an increasingly important subject of disaster-related learning and adaptation research, particularly for scholars interested in media and community responses to on-going global environmental change (e.g. Leitch & Bohensky, 2014; Moritz et al., 2014; O'Neill & Handmer, 2012). In this study, we investigate media discourse on wildfire-related learning and adaptation via an analysis of local newspaper coverage of three catastrophic wildfires that burned in two wildland–urban interface¹ (WUI) communities in the western United States in 2012 and 2013. Learning and adaptation are especially pressing for WUI communities because they are uniquely exposed to wildfire hazards and because they are key players in exacerbating and/or mitigating those hazards (McCaffrey, Toman, Stidham, & Shindler,

2013). This study builds from the premise that adapting to growing wildfire risk will require WUI communities to learn from past wildfires and apply lessons towards mitigating hazards, exposures, and vulnerabilities (Leitch & Bohensky, 2014).

Media are both “important *arenas* and important *agents* in the production, reproduction, and transformation of the meanings of social issues” (Carvalho, 2010, p. 172), including in communities’ disaster-related learning and adaptation processes (Leitch & Bohensky, 2014). However, media’s role as an arena for disaster-related learning and adaptation discourse remains under-theorized in at least three ways of importance in the Anthropocene. First, disaster media studies often focus on media coverage of a single disaster (e.g. Ashlin & Ladle, 2007; Bohensky & Leitch, 2014; Robinson, 2009); in so doing, single-disaster studies may or may not consider the increasing likelihood of multiple disasters. When studies do take up media coverage of multiple disasters, they often synthesize among disasters that occurred at a distance from each other, rather than disasters that have occurred in close proximity (e.g. Leitch & Bohensky, 2014; Paveglio, Norton, & Carroll, 2011). As a result, while previous studies lend crucial insights on learning and adaptation discourse in the media, they rarely explicitly address circumstances of simultaneous or recurring disasters in the same or proximate communities. Second, studies often focus on media coverage during a disaster or its immediate aftermath rather than placing a disaster within the broader disaster cycle of response, recovery, hazard mitigation, and preparation for future disasters (e.g. Paveglio et al., 2011; Robinson, 2009; for disaster cycle phases, Petak, 1985). And third, disaster media studies have yet to connect the media’s role as an agent of collective memory (Edy, 1999) with learning and adaptation specifically. We work to complement previous research and engage these knowledge gaps by analysing local media discourse in two proximate Colorado communities that faced three simultaneous and/or recurring catastrophic wildfires in 2012 and 2013. We focus on how local media commemorate these wildfires on their anniversaries within a broader analysis of media coverage from before, during, and after the wildfires.

This study has practical and theoretical goals. On a practical level, we ask if wildfire anniversaries serve as time periods for critical reflection on wildfire hazard mitigation in local media and investigate the effects of simultaneous/recurring wildfires on learning and adaptation in media discourse. Prior scholarship suggests that wildfire media coverage typically ignores learning and adaptation processes (Koebele et al., 2015; Leitch & Bohensky, 2014; Paveglio et al., 2011), but also that anniversary coverage of such events could represent an important exception because of the media’s role as an agent of collective memory (Edy, 1999) and the importance of collective memory to learning and adaptation (Colten & Sumpter, 2009). On a theoretical level, we join others (Tenenboim-Weinblatt, 2013; Trümper & Neverla, 2013) in bridging the temporal divide between two areas of media theory: collective memory theory, which focuses on the media’s use of the *past*, and agenda-setting theory, which focuses on the media’s orientation toward the *future*. As will be explained in more detail below, we further develop Tenenboim-Weinblatt’s (2013) concept of “mediated prospective memory,” defined as “mission-oriented” remembrance (p. 98).

Literature review

Community learning and adaptation amidst growing wildfire hazards

Growing wildfire hazards are the product of factors that are prevalent in the western United States, but not unique to the region—namely, the convergence of fire-adapted ecosystems with dense fuel loads resulting from historic and contemporary wildfire suppression, rapid human development of the WUI, and a warming climate (Marlon et al., 2012; Theobald & Romme, 2007; Westerling et al., 2006). Globally, WUI expansion and wildfire suppression are a concern from Mediterranean Europe to Australia, and pyrogeographic models estimate that climate change has already lengthened the

wildfire season across 25% of the Earth's vegetated surface (Jolly et al., 2015). In the western US, a combination of overgrown forests, WUI expansion, and climate change have spurred more frequent large fires (Dennison, Brewer, Arnold, & Moritz, 2014), while climate change alone has been credited with nearly doubling annual burned area since 1984 (Abatzoglou & Williams, 2016). Colorado's Front Range² illustrates these trends well (Litschert, Brown, & Theobald, 2012), reflecting similar conditions in fire-prone regions worldwide (Liu et al., 2010).

The US federal-level response has been largely to increase wildfire suppression activity in order to protect lives, property, and natural resources. In 2015, the US Forest Service spent over half its budget on wildfire suppression for the first time ever—a record \$2.6 billion. In order to meet firefighting costs, the agency has been forced to drain funds from hazard mitigation projects (United States Forest Service, 2016). These trends have inspired broad calls for a change in approach in the US (Moritz et al., 2014), which echo similar appeals from other fire-prone regions of the world (O'Neill & Handmer, 2012). Resilience-oriented scholars argue for a shift away from the firefighting-oriented “command and control” response to wildfire and toward a “sustainable coexistence” model that involves recognizing wildfire as an inevitable ecosystem process and adapting to it (Moritz et al., 2014). Recommended adaptations include diminishing hazards (e.g. fuel reduction at the landscape scale and around homes), reducing exposure (e.g. improving building codes and limiting development in high-hazard WUI areas), reducing vulnerability (e.g. engaging vulnerable populations in planning), and increasing the adaptive capacity of institutions (e.g. creating pathways for continual learning) (Moritz et al., 2014; O'Neill & Handmer, 2012).

Local governments and individuals are at the centre of these proposed learning and adaptation processes in many fire-prone regions (Goldammer et al., 2002).³ In the western US, communities are key players in exacerbating *and* mitigating wildfire hazards for several reasons: 70% of the WUI is private property (Schoennagel, Nelson, Theobald, Carnwath, & Chapman, 2009); home building is controlled at the local level and 86% of the WUI may still be developed (Gude, Rasker, & van den Noort, 2008); and WUI ignitions impact large populations (Haas, Calkin, & Thompson, 2014). The importance of local government and individual participation in wildfire hazard mitigation has been further solidified by federally-supported programmes such as Firewise and Community Wildfire Protection Planning, which encourage the participation of homeowners, neighbourhoods, and communities in fuel reduction and defensible space projects under an informal ethos of shared responsibility (Gorte, 2013). As a result, the success of these programmes depends upon the initiative of residents (Koebele et al., 2015) and the provision of limited local, state, and federal funding to defray project costs (Gorte, 2013; McCaffrey et al., 2013; USFS, 2016).

Against this backdrop of growing wildfire frequency and size, plus local involvement, it is increasingly important to understand wildfire learning and adaptation at the community level. We define learning and adaptation as “internalizing lessons from past experience and knowledge of disasters, putting such lessons into practice, and avoiding past mistakes” (Leitch & Bohensky, 2014, p. 16). This definition draws from the resilience literature's findings on the importance of collective memory in learning and adaptation—in other words, a community's ability to remember disasters and apply memories to making individual and institutional changes (Colten & Sumpter, 2009). Because of its resilience literature origins, this definition acknowledges that history does not provide a perfect map for the future, but it maintains that learning from past disasters is crucial for adaptation. Importantly, this definition demands more than re-attainment of the status quo after a disaster. It contemplates how a community might use recovery processes to *reduce* hazards, exposures, and vulnerabilities for the future (Bohensky & Leitch, 2014; Moritz et al., 2014). In this study, we take an initial step towards understanding learning and adaptation by analysing how local media discuss these topics in wildfire coverage.

The role of media in learning and adaptation from socio-natural disasters

Meaning, policy problems, and causality

The media participate in socio-natural disasters in myriad interrelated ways, many of which have implications for learning and adaptation. At a societal level, highly visible disasters such as catastrophic wildfires have the potential to serve as “focusing events” that promote policy change (Birkland, 2006). Media play an important agenda-setting function in these windows of opportunity by focusing public attention on disaster-related issues and maintaining those issues on the public agenda (McCombs, 2004; Scheufele & Tewksbury, 2007). Media also shape discourse around disasters by emphasizing certain policy problems and solutions, drawing causal links, and assigning blame and responsibility (Boykoff, 2011; Crow et al., 2016). After a disaster, media also contribute to “a collective social script, which helps to shape how a community ... begins the coping and recovery process” (Leitch & Bohensky, 2014, p. 15).

At an individual level, news coverage can raise awareness of hazards. According to previous wildfire research, media are among the sources that WUI residents turn to for information on wildfire hazards and mitigation (Johnson, Bengston, Nelson, & Fan, 2006; McCaffrey & Olsen, 2012), though actual mitigation behaviour is complex (e.g. Brenkert-Smith, Champ, & Flores, 2012). More fundamentally, media discourse can influence peoples’ sense of agency by conveying notions of citizens’ “rights, their responsibilities, and their space for political action” (Carvalho, 2010, p. 174). By extension, the media also contribute to “cultivating peoples’ dispositions to action or inaction,” especially on unobtrusive environmental issues (Carvalho, 2010, p. 174) and in relationship to socio-natural disasters (Cowan, McClure, & Wilson, 2002). In the context of socio-natural disasters, media discourse forwards various models of nature and humans’ role within it (Hajer, 1995), plus messages of risk and uncertainty (Carvalho & Burgess, 2005).

When it comes to wildfire specifically, media have been critiqued for perpetuating the “command and control” approach to wildfire by spotlighting firefighting and ignoring underlying systemic causes and policy problems. Media typically cover wildfires as though they were urban blazes, focusing on a fire’s specific ignition source and portraying WUI residents as helpless victims (Johnson et al., 2006; Paveglio et al., 2011). These patterns synch with trends in disaster coverage more broadly. Media have long been critiqued for providing short-term attention to disasters, and for overlooking disasters’ combined social-ecological causes and the underlying policy problems that exacerbate them (Houston, Pfefferbaum, & Rosenholtz, 2012; Ploughman, 1995; Robinson, 2009). Even in wide-ranging studies of resilience discourse, media show little attention to learning and adaptation themes (Leitch & Bohensky, 2014).

Collective memory, the media agenda, and anniversaries

By contrast, a potentially fruitful area for individual- and community-level learning and adaptation discourse in the media is its collective memory work. As discussed above, collective memory—the meaning that communities make of their pasts (Halbwachs, 1926/1980)—is key to learning and adaptation because it provides the foundation for a community to internalize lessons from past events and apply them to making changes (Colten & Sumpter, 2009). Media play a special societal role in shaping collective memory by writing “the first draft of history,” and for doing history’s “rewrites” later on, especially on the anniversaries of events (Edy, 1999, p. 71). Indeed, studies have shown that people’s memories of an event tend to mirror the mediated version (Lang & Lang, 1989), and that media are capable of maintaining the memory of a disaster on the media agenda for decades (Trümper & Neverla, 2013). And yet the relationship between collective memory and learning and adaptation discourse in the media remains understudied. Thus far, studies of collective memory and disaster news have taken up topics ancillary to community learning and adaptation, such as environmental issues (Ashlin & Ladle, 2007), journalist’s assertions of authority to convey collective memory (Robinson, 2009), and the persistence of dominant sociocultural values in commemorative journalism (Su, 2012).

As wildfire hazards multiply, it is important that we develop a better understanding of whether media narrations of the past incorporate learning and adaptation discourse for the future. On this front, the concept of “collective prospective memory” is useful. Collective prospective memory describes the collective recognition of what still needs to be done to remedy a problem in the present and future, based on the past. Tenenboim-Weinblatt (2013) offered the concept in relationship to the media in an effort to connect two major areas of media theory: past-oriented collective memory theory and future-oriented agenda-setting theory. In a study of media coverage of kidnappings, Tenenboim-Weinblatt (2013) found that journalists did not exclusively invoke the past *or* the future in expected ways (Neiger, 2007; Zelizer, 2008), but that they occasionally used prospective memory practices to bridge the two temporal orientations in a “mission-oriented” form of remembrance (p. 98) that served to actively maintain the unresolved issue of kidnappings on the media agenda (McCombs, 2004). The author provided three specific examples of these “mediated prospective memory” practices: (1) explicit reminders of unresolved issues (e.g. reminders that a person is in captivity), (2) marking time (e.g. counting days spent by a person in captivity), and (3) actively constructing windows of opportunity (e.g. claiming a captive must be rescued by a certain date). Because kidnappings are “unobtrusive” issues that most people do not experience directly, the media’s “mission-oriented” remembrances kept them on the media agenda when they might otherwise have been forgotten (Tenenboim-Weinblatt, 2013). Here, we further theorize the practice of mediated prospective memory-making by extending it to hazard mitigation activities in the context of increasingly obtrusive wildfire hazards.

We take up mediated prospective memory-making—and learning and adaptation discourse more broadly—in anniversary commemorations of wildfires. We choose anniversaries as a timeframe for study because they can be key periods for negotiation of an event’s causes, its meanings, and its implications in media (Edy, 1999; Robinson, 2009; Zelizer, 2008). In terms of disasters, for example, anniversary stories occasionally address causes in far more nuanced terms than typical reporting—a phenomenon called “the progressive localization of cause” (Hilton, Mathes, & Trabasso, 1992, p. 53). Disaster anniversaries are not guaranteed to foster learning and adaptation discourse, however. While anniversary coverage is important for collective memory-making in the media, it rarely connects the past to the present in a meaningful way (Edy, 1999). Furthermore, some commemorative stories may celebrate survivors without probing a disaster’s underlying causes (Bohensky & Leitch, 2014) or perpetuate the status quo by espousing dominant values and excluding alternative narratives of events (Su, 2012). It is unclear, however, if or how these patterns in media coverage of wildfire might change as disasters such as catastrophic wildfires increase in frequency and size.

Given this review of the relevance of media agendas to public and policy agendas, we stress that our focus here is on better understanding learning and adaptation in the context of local media discourse and local media agendas. Future research should take up media effects (McCombs, 2004).

Case study and research questions

The wildfire season of 2012 was the worst on record in Colorado, and one of the worst nationally. In June 2012, the High Park Fire killed one person and destroyed 259 homes near Fort Collins. Two weeks later, while High Park was still burning, the Waldo Canyon Fire killed two people and burned 347 homes in Colorado Springs. A third wildfire relevant to our study occurred a year later: the Black Forest Fire, which burned just outside of Colorado Springs in June 2013, during the one-year anniversary of the Waldo Canyon Fire. It killed two people and destroyed 486 homes. Each of these three fires qualified as the most destructive in state history when it burned. In this study, we explore learning and adaptation in the context of these simultaneous and recurring catastrophic wildfires. We define *simultaneous* wildfires as per the 2012 Waldo Canyon and High Park blazes—two major wildfires that burned in two different, but not distant, communities in the same state at the same time.⁴ We define *recurring* wildfires as per the Waldo Canyon and Black Forest wildfires in 2012 and 2013—two major wildfires that burned different parts of the same community (the greater Colorado

Springs area) in back-to-back wildfire seasons. Drawing from media coverage of these wildfires, we ask:

RQ1: Does local media coverage of the anniversaries of catastrophic wildfires differ from media coverage during the rest of the wildfire disaster cycle in terms of learning and adaptation discourse? If so, how?

RQ2: What effects do multiple catastrophic wildfires—in the form of simultaneous wildfires and recurring wildfires—have on learning and adaptation discourse in local media?

Research design and methods

In this study, we conducted a content analysis that combines deductive and inductive techniques following the mixed-method approaches of related studies on disaster discourse in the media and mediated prospective memory practices (Leitch & Bohensky, 2014; Tenenboim-Weinblatt, 2013, respectively). In particular, we carry forward Tenenboim-Weinblatt's updated and pragmatic approach to grounded theory, wherein “developing categories and concepts from the data is not a purely inductive process, but is rather based on an interplay between existing theoretical frameworks and new categories that emerge during the coding and analysis” (2013, p. 94). The content analysis proceeded in two phases. As per Leitch and Bohensky (2014) and Tenenboim-Weinblatt (2013), each phase began with a closed coding approach before moving to analysis of emergent themes.

The *first research phase* consisted of a broad assessment of news coverage of the 2012 Waldo Canyon and High Park wildfires (Crow et al., 2016). We collected data from newspapers because of their continued influence on the media agenda (Miles & Morse, 2007) and their reliable archiving methods. Local newspapers are also key forums for engaging residents on local political issues, especially disasters (Robinson, 2009; Scheufele, Shanahan, & Kim, 2002). Articles were collected from local newspapers in Colorado Springs (*The Gazette*) and Fort Collins (*The Coloradoan*) and from *The Denver Post*, which covers the state of Colorado, using search terms described in Table 1.⁵ We gathered articles from six months prior to the wildfires to just over one-year post-ignition (1 January 2012 to 30 June 2013) (Figure 1, Table 1). This time period allowed us to capture pre-, during- and post-fire media coverage and generated a large sample ($n = 881$). Later, we removed the one-year (2013) anniversary coverage from this dataset, as will be explained below. In the results, we call the 18-month coverage, minus the 2013 anniversary stories, our “18-month sample” ($n = 849$).

Six coders used an a priori closed coding framework adapted from Heikkila et al. (2014) to identify policy problems in each article. An article included a policy problem if it articulated a

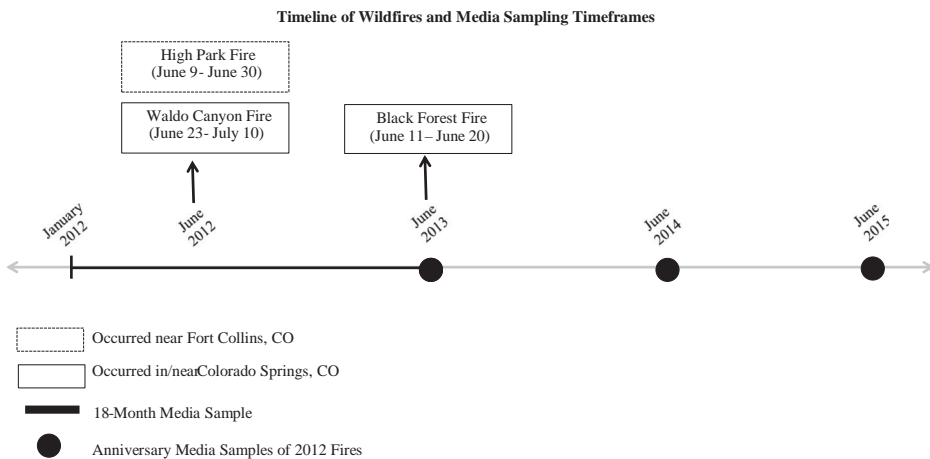


Figure 1. Timeline of wildfires and media sampling.

Table 1. 18-Month sample (1 January 2012–31 May 2013) search terms, newspapers, and article counts.

Newspaper	Audience	Circulation	Search terms	Article count
Colorado Springs Gazette	Local	64,394 daily	Pre-fire: fire mitigation, fire prevention, fire management, fire risk Post-fire: Waldo Canyon, Waldo Wildfire, Colorado Springs Wildfire	311
Fort Collins Coloradoan	Local	28,501 daily	Pre-fire: fire mitigation, fire prevention, fire management, fire risk Post-fire: High Park Fire, Fort Collins Wildfire	292
Denver Post	Statewide and regional	416,676 daily 509,571 daily	Inclusive of all terms used above Total	246 849

Notes: First anniversary (circa June 2013) articles are not included in this sample.

wildfire-related problem that people could (or should) work to address through collective and/or individual actions. We chose to focus on the appearance of policy problems in the media because making institutional and individual changes is a key aspect of community-level learning and adaptation processes (Colten & Sumpter, 2009). Common examples of policy problems include the problem of managing WUI home development, the problem of overgrown forests, and the problem of not having enough firefighting resources (for further examples, please see Table 4). The coders followed standard instructions to foster consistency and reliability in coding (Krippendorf, 2004). Using a random subset of articles (10%), coders achieved 100% agreement ($\alpha = 1.0$) on the presence of a policy problem. After quantitatively coding for the presence/absence of policy problems, coders recorded policy problem definitions with short qualitative descriptions (e.g. those listed above and in Table 4).⁶ After all policy problem definitions had been gathered, the first author read them closely, analysing and coding for common topics (Miles & Huberman, 1994). Once topically coded, it became clear that the policy problems fell into two categories that centered either on “causes” or “symptoms” of wildfire, substantiating the findings of previous research by Paveglio et al. (2011), Hilton et al. (1992), Houston et al. (2012), and others noted in the literature review. The first author sorted policy problems accordingly into “cause” or “symptom” categories. These categories are described further in the results and common policy problem topics are presented in more detail in Table 4.⁷

The first phase of analysis revealed unique trends within one-year anniversary coverage of the fires, such as more frequent discussion of wildfire policy problems. These trends prompted a *second phase* of research that examined anniversary coverage specifically. The first author generated an “anniversaries only” sample by separating one-year anniversary articles from the larger dataset and collecting commemorative articles published in June⁸ of 2013, 2014, and 2015 (Table 2). The first author then conducted a second round of coding with this smaller “anniversaries only” sample ($n = 49$) that examined mediated prospective memory discourse by applying an a priori coding framework developed from Tenenboim-Weinblatt (2013) that identified references to past, present, and future. Specifically, the coding scheme asked if an article: (1) mentioned past wildfires, (2) invoked the future, and (3) drew connections between past and future (and if so, how, for each item). Two coders coded a random subset of articles (10%) and achieved full agreement after one round of coding and discussion. The first author then analysed the coded data with the aim of further developing the mediated prospective memory concept. Following the process described in Tenenboim-Weinblatt and noted above (2013), the first author analysed the coded data with previous research “in mind,” while also looking “for the places in which existing frameworks fail to account for certain phenomena” (p. 94). The mediated prospective memory practices identified in this research emerged through this process; each practice appeared in multiple articles, as demonstrated in the results.

One-year anniversaries can be especially important time periods for debates about learning and adaptation (Ashlin & Ladle, 2007; Robinson, 2009). As a result, the strength of this study design is

Table 2. Anniversaries only sample (June 2013, 2014, 2015) newspapers and article counts.

Anniversary	#1 2013	#2 2014	#3 2015	Search terms	Article count
Colorado Springs <i>Gazette</i>	22	8	3	Same as Table 1 post-fire terms	33
Fort Collins <i>Coloradoan</i>	3	4	0	Same as Table 1 post-fire terms	7
Denver <i>Post</i>	7	2	0	Same as Table 1 post-fire terms	9
Total	32	14	3		49

Note: Sample was narrowed to include only stories directly commemorating the Waldo Canyon or High Park wildfires.

that learning and adaptation discourse from the most discursively important anniversary of these wildfires in the media—the first, in 2013—can be compared against an 18-month period before/after the wildfires and later anniversaries, rather than being studied in isolation. That said, it is important to note that our “anniversaries only” sample differed significantly among the newspapers sampled for the study, with Colorado Springs *Gazette* out-publishing the other newspapers (Table 2). This could be because the Waldo Canyon Fire destroyed more homes than did the High Park Fire, or because 24% of Colorado Springs’ population lives in the WUI and the city has been active in hazard mitigation, making wildfire especially salient there. As a result, the analysis below draws most heavily from *The Gazette*. Because the “anniversaries only” dataset is small ($n = 49$) and influenced heavily by one newspaper, it is important to keep in mind the potential effects of individual reporters and a single newsroom’s editorial staff on the results.⁹

Results

Anniversary coverage and policy problems

RQ1: Does local media coverage of the anniversaries of catastrophic wildfires differ from media coverage during rest of the wildfire disaster cycle in terms of learning and adaptation discourse? If so, how?

To address this question, we focused on policy problems in each of our media samples, assessing both frequency of appearance and type of policy problem in wildfire anniversary coverage as compared to non-anniversary coverage (the 18-month sample). With the critical distance provided by hindsight, the anniversary media coverage of the Waldo Canyon and High Park was much more likely to include discussion of policy problems (80%) than was coverage from the non-anniversary sample (43%) (Table 3). A chi-square analysis indicated that the higher frequency of articulated policy problems in anniversary stories, as compared to non-anniversary stories, was statistically significant ($p \leq .001$). (Please see Table 3 for an overview of policy problem data. Table 4 presents policy problems in more detail.)

Table 3. Media samples compared regarding presence of a policy problem and type.

	18-month sample ($n = 849$)	Anniversary coverage 2013–2015 ($n = 49$)
Policy problem (% within sample and #)	43% (369)	80% (39)
Present	43% (369)	80% (39)
Absent	57% (480)	20% (10)
	χ^2 (df = 1) = 24.391, $p < .0001$	
Symptoms	77% (283)	49% (19)
Causes	23% (86)	51% (20)
	χ^2 (df = 1) = 14.355, $p = .0002$	

Notes: As discussed in methods section, these categories are independent. The 18-month sample did *not* include 2013 anniversary coverage. Articles were coded for primary policy problem. Policy problems were categorized as *either* symptoms or causes (examples in Table 4).

Table 4. Policy problems appearing in 18-month sample and at the 2013, 2014, 2015 anniversaries of the Waldo Canyon and High Park wildfires.

18-Month sample			
Late fall-winter (non-fire season): $n = 125$; # with a policy problem = 67 (54%)			
Symptoms ($n = 56$, 84% of policy problems)		Causes ($n = 11$, 16% of policy problems)	
Need firefighting & recovery resources/funds	21	Need to better manage WUI growth/risks	5
Firefighting response challenges & issues	13	Need to plan for warmer climate/longer fire season	4
Problems with insurance	12	Need more landscape-scale mitigation	1
Problems with post-fire recovery & hazards	10	Need more mitigation by WUI homeowners	1
Spring (borderline fire season): $n = 107$; # with a policy problem = 58 (54%)			
Symptoms ($n = 49$, 84% of policy problems)		Causes ($n = 9$, 16% of policy problems)	
Need firefighting & recovery resources/funds	17	Need more landscape-scale mitigation	3
Firefighting response challenges & issues	14	Need for more mitigation by WUI homeowners	2
Problems with post-fire recovery & hazards	10	Need to plan for warmer climate/longer fire season	2
Problems with insurance	8	Need to better manage WUI growth/risks	2
Summer-early fall (fire season)^a: $n = 617$; #with a policy problem = 244 (40%)			
Symptoms ($n = 178$, 73% of policy problems)		Causes ($n = 66$, 27% of policy problems)	
Problems with wildfire hazards & recovery	70	Need to better manage WUI growth/risks	26
Need firefighting & recovery resources/funds	46	Need for more mitigation by WUI homeowners	16
Firefighting response challenges & issues	45	Banning Independence Day fireworks use	7
Problems with insurance	17	Need to plan for warmer climate/longer fire season	6
		Need more landscape-scale mitigation	6
		Issues determining exact cause of wildfire ignition	5
Anniversary coverage			
One-year anniversary (June 2013): $n = 32$; # with a policy problem = 24 (75%)			
Symptoms ($n = 10$, 42% of policy problems)		Causes ($n = 14$, 58% of policy problems)	
Firefighting response challenges & issues	3	Need to better manage WUI growth/risks	9
Need firefighting & recovery resources/funds	3	Need for more mitigation by WUI homeowners	3
Problems with insurance	2	Need more landscape-scale mitigation	1
Problems with post-fire recovery & hazards	2	Issues determining exact cause of wildfire ignition	1
Two-year anniversary (June 2014): $n = 14$, # with policy problems = 13 (93%)			
Symptoms ($n = 7$, 54% of policy problems)		Causes ($n = 6$, 46% of policy problems)	
Problems with insurance	5	Issues determining exact cause of wildfire ignition	3
Firefighting response challenges & issues	2	Need to better manage WUI growth/risks	2
		Need more landscape-scale mitigation	1
Three-year anniversary (June 2015): $n = 3$, # with policy problems = 2 (67%)			
Symptoms ($n = 2$, 100% of policy problems)		Causes ($n = 0$)	
Problems with insurance	2		

Notes: Fire season here is defined as June–September, when the hottest and driest weather is present. We consider “borderline” fire season to be the March–May, leading up to fire season. We deem the rest of the year (October–February) non-fire season; wildfires are not impossible in these months, but they are more rare.

^aWithout Anniversary 2013 coverage.

Anniversary coverage often did more than just raise policy issues; it raised problems associated with wildfire causes and their mitigation. Tables 3 and 4 illustrate this by dividing policy problems into “symptoms” or “causes.” These categories stem from previous research that critiques media for overlooking the root causes of wildfire hazards while emphasizing symptoms of the problem (Houston et al., 2012; Paveglione et al., 2011), as well as more favourable findings that media are capable of interrogating disasters’ causes with time (Hilton et al., 1992). The “symptoms” category refers to policy problems tied to the *impacts* of catastrophic wildfire, such as evacuation issues, insurance challenges, and post-fire flooding and erosion. Causal policy problems, on the other hand, are those tied to the *drivers* of catastrophic wildfire, such as decades of wildfire suppression, building in the WUI, and climate change.

Overall, most of the policy problems discussed in the 18-month, non-anniversary media sample addressed *symptoms* of catastrophic wildfire. The emphasis on wildfire *symptoms* over *causes* was prevalent year-round, but was most pronounced during peak wildfire season, when stories often focused on active blazes and firefighting resource needs (Table 4; $\chi^2 = 5.645$, $p = .018$). Interestingly,

wildfire anniversary coverage (2013–2015) reversed this trend in policy problem discourse by devoting more than half (51%) of its discussions of policy problems to *causal* policy problems specifically, such as the need to better plan or control WUI development and the need for more forest thinning at residential and landscape scales (Table 4). A chi-square analysis indicated that the higher frequency of *causal* policy problems articulated in anniversary coverage, as compared to non-anniversary stories, was statistically significant ($p \leq .001$) (Table 3). Importantly, the emphasis on causal policy problems appeared even though all anniversary stories were published during peak wildfire season when media usually emphasize wildfire symptoms ($\chi^2 = 9.334, p = .002$).

Even so, some anniversary stories (20%) did not raise policy problems at all. Moreover, as time passed and commemorative stories diminished, causal policy problem discourse also shifted. Rather than focusing on systemic causes of wildfire hazards and their mitigation, later anniversary stories highlighted ongoing police investigations of specific ignition sources. By anniversary three, commemorative coverage was free of causal policy problems (Table 4).

Multiple wildfires and mediated prospective memory

RQ2: What effects do multiple catastrophic wildfires—in the form of simultaneous wildfires and recurring wildfires—have on learning and adaptation discourse in local media?

To address this question, we focused on mediated prospective memory discourse within our “anniversaries only” sample. As explained above, mediated prospective memory practices were identified as recurring themes within stories that invoked past wildfires, mentioned the future, and then connected past with future in some way (Tenenboim-Weinblatt, 2013). In that sample, we identified two mediated prospective memory practices focused on learning and adaptation: (1) invoking hindsight as foresight and (2) recognizing a new normal that demands action. Both practices encouraged residents to learn from past wildfires and to adapt to wildfire hazards going forward. They appeared primarily in Colorado Spring’s local media coverage of the first anniversary of the Waldo Canyon Fire, as journalists attempted to memorialize one catastrophic wildfire while a second burned. Such discourse did not appear to the same degree in Fort Collins; neither did it persist after 2013. By 2014 and 2015, mediated prospective memory discourse increasingly focused on (3) a race to rebuild that centred on re-achieving status quo housing numbers in the WUI. Each mediated prospective memory practice is described below via an example story.

Invoking hindsight as foresight

On 12 June 2013, a reporter from *The Gazette* stood on a hillside overlooking the charred neighbourhood of Mountain Shadows, the part of Colorado Springs hit the hardest by the Waldo Canyon Fire, alongside its original developer and a resident rebuilding his home. Their position gave them a clear view of smoke to the east—the Black Forest Fire, ignited the day prior. In a commemorative story published on Waldo Canyon’s anniversary, the two men looked back on Mountain Shadows’ transition from a cattle ranch to a neighbourhood and reflected on how little thought people had given to wildfire in the past (Vogrin, 2013). Even the developer expressed regret in mandating (flammable) wood shingle roofs in the subdivision’s original covenants. “They were very much in vogue at the time,” he lamented.

The story used lessons of the Waldo Canyon fire, derived with the clarity of hindsight, to make a case for foresight in future WUI construction. The developer and resident contemplated historical mistakes in the context of the in-progress rebuild, using the past to make a case for what hazard mitigation still needed to be done while the actively burning Black Forest Fire emphasized the persistence of risk. All homes were being rebuilt with fire-resistant materials, as per Colorado Springs’ updated codes for new construction.¹⁰

Other one-year anniversary stories similarly invoked hindsight as a method for reminding community members of the mitigation work left to do in Colorado Springs. One deemed Black Forest and Mountain Shadows as places that “for years have been identified as disasters waiting to happen”

(Handy & Wells, 2013). Another highlighted the city's southwestern end, saying that the recent wildfires should have "served as a scary warning" for the thousands of people living there (Chacon, 2013).

Recognizing a new normal

The same day, a group of community historians met in a different location—Colorado Springs' downtown Pioneer Museum—and debated whether they should cancel the opening of a memorial exhibit. Their consternation became the subject of a second *Gazette* story that attempted to commemorate the Waldo Canyon Fire as the Black Forest Fire spread (Handy, 2013). In this story, local historians parted with their assumption that wildfires occurred only every 50 years and wondered aloud how they would adjust to an increasingly unpredictable future.

The article's author put the new circumstances more dramatically. "El Paso County's historical trajectory has taken a sharp turn, into a new realm," the author wrote. "From this point forward, the community's biggest milestones ... will now count among them the deaths of four people and the destruction of nearly 900 homes in one year." The article, and others after it, asked what recurring catastrophic wildfires meant for Colorado Springs and came up with a common answer: the dawning of a new normal of increased wildfire hazard.

Like the hindsight-as-foresight discourse above, the new normal discourse also directly linked past catastrophic wildfires to the need for present and future hazard mitigation. The *Gazette's* editorial board provided an additional example, writing, "We must acknowledge that [wildfires] pose a constant threat and live accordingly. We must accept these fires as the new normal" (Gazette Editorial Board, 2013). The board highlighted tree thinning, creating defensible space around homes, and revising land use and building codes as important mitigation measures.

Racing towards recovery

Surprisingly, the back-to-back fires in Colorado Springs also inspired anniversary stories that contradicted the learning and adaptation discourse described above by setting up a comparison that hinged upon which burn zone was rebuilding more quickly. These comparisons were a mediated prospective memory practice in their own way: reminding readers of home losses and rebuilding yet to be done. This practice began in 2013, intensified in 2014 and 2015, and appeared across all three newspapers.

Most of these stories celebrated the speedy rebuilding of the Mountain Shadows neighbourhood mentioned above, positioning it as a high bar against which to measure other recoveries. The peak of these plaudits came in 2013, when *The Denver Post* published a story calling the neighbourhood a national model for wildfire recovery (Meyer, 2013). In the same story, a regional planning official said that only five days after Black Forest Fire containment local officials were using Mountain Shadows as a rebuilding record to beat. "It's like anything, you get off to a good start, and you always seem to win the race," he said.

By 2014, the Mountain Shadows success story had been further cemented into wildfire commemorations, but it was also becoming a topic of critique. The *Gazette* heralded its record-breaking 77% rebuild rate, but also noted that, even though all 250 new homes had been built with fire-resistant materials, they had also been rebuilt 14% larger on average (Handy, 2014), a trend that is not unique to Colorado (Simon, 2014). Rebuilding had also picked up in High Park. "Lots are changing hands like crazy ... We feel like there's no fire threat for 50 years," said one resident, referring to the burn scar (Ferrier, 2014). But academic sources questioned the long-term wisdom of adding more fuel to the landscape in the form of bigger houses, and cast doubt on whether wildfire hazards had abated for 50 years.

Such critiques did not last into 2015 media coverage. By the third anniversary of Waldo Canyon and the second anniversary of Black Forest, any invocations of mediated prospective memory linking past wildfires to future hazard mitigation had faded (see also Table 4 and the fading of causal policy problems from 2013–2015). County assessors expressed amazement at climbing WUI property values. Said one Mountain Shadows resident from her new front porch, "In some ways, things are better now ... We all have better houses" (St. Louis-Sanchez, 2015).

Discussion

This study undertook an examination of local media coverage of three wildfire disasters in two Colorado communities to explore whether anniversaries serve as time periods for critical reflection on wildfire hazard mitigation in local newspapers, and to investigate the effects of simultaneous and recurring wildfires on learning and adaptation discourse in the media. Our analysis was motivated by the Anthropocene's growing wildfire size and frequency and by calls for a shift toward "sustainable coexistence" with wildfire (Moritz et al., 2014; O'Neill & Handmer, 2012). The study focused on newspapers in WUI communities because they are key players in wildfire hazard exacerbation and/or mitigation in the western US and other parts of the world. We analysed policy problem definitions and mediated prospective memory practices as examples of learning and adaptation discourse in the media.

Our results suggest that local media do convey messages about learning and adaptation, particularly when commemorating wildfire. This finding nuances scholarship that critiques the media for perpetuating "command and control" discourse about wildfire hazards (e.g. Paveglio et al., 2011). Anniversary stories were more likely to raise wildfire-related policy problems than was non-anniversary wildfire coverage. Furthermore, anniversary coverage was more likely to highlight *causal* policy problems—for example, better managing WUI growth—in the manner of Hilton et al.'s "progressive localization of cause" (1992). This trend was strong in one-year anniversary coverage, but it waned in later years. The timing of this adaptation discourse was also important in that it appeared in the middle of the wildfire season, a salient timeframe for communicating about wildfire hazard mitigation (Johnson et al., 2006) that might otherwise have been dominated by firefighting themes (Table 4).

With the appropriate caveats about the anniversary sample being small and influenced heavily by one local newspaper, it was also surprising to see that some commemorative stories effectively connected past experience to the present and future, contrary to Edy's (1999) findings that media commemorations typically do not link to contemporary issues. Local media drew connections between past, present, and future via the mediated prospective memory practices of (1) using hindsight as foresight, (2) identifying a new normal that demands action, and (3) racing to rebuild.

These formulations of mediated prospective memory suggest that disaster-related commemorations may depart from Edy's (1999) typology under circumstances such as recurring disasters. The back-to-back timing of Colorado Springs' catastrophic 2012 and 2013 wildfires appeared to influence the emergence of the two mediated prospective memory practices that forged past with future to convey urgency around hazard mitigation. High Park Fire commemorations did not include the same frequency of mediated prospective memory discourse, partly because the Fort Collins-based *Coloradoan* published so few commemorative stories (Table 2). This suggests that recurring catastrophic wildfires may be a more powerful driver of learning and adaptation discourse in local media than simultaneous wildfires in neighbouring communities. This finding deserves further scrutiny with a larger dataset given the potential for individual journalists and editors to influence small datasets such as our "anniversaries only" sample.

In methodological and theoretical terms, the concept of mediated prospective memory served as a useful heuristic for considering the potential links between collective memory and learning/adaptation discourse in disaster media, despite being drawn from the very different context of international kidnapping coverage (Tenenboim-Weinblatt, 2013). The practices uncovered in our sample fit within Tenenboim-Weinblatt's (2013) first category of "reminders of unresolved issues," but with some differences. In that study, mediated prospective memory practices kept kidnappings on the media agenda in a way that reminded national government actors about an "unobtrusive" issue that might otherwise have been publicly forgotten. In our sample, mediated prospective memory practices presented local government and residents with reminders of the importance of wildfire mitigation in the face of the increasingly "obtrusive," but still often underestimated, issue of wildfire hazards.

Because wildfire hazard mitigation policies often operate via individual and community initiative, media reminders about growing hazards and mitigation needs seem especially important contributors to, in Carvalho's words, "cultivating peoples' dispositions to action or inaction" (2010, p. 174). Unlike kidnapping cases, there is no clear resolution to wildfire hazards for a WUI community; hazard mitigation is a long-term project that requires persistence and prompting. Of course local media are not the only source of wildfire information for WUI residents and local officials, and actual mitigation behaviour are complex and beyond the scope of this study. Still, as newspapers highlighted causal policy problems and unfinished mitigation work on wildfire anniversaries, they sustained learning and adaptation on the local media agenda, for a time. Future studies should assess the *effects* of the local media agenda on public and policy agenda dynamics such as public opinion related to wildfire risk reduction requirements placed on homeowners, or the prioritization of funding for wildfire hazard mitigation projects versus wildfire suppression in the western US and abroad.

And yet learning and adaptation discourse faded after June 2013, the one-year anniversary of the 2012 wildfires and the month of the Black Forest Fire. As discussions of hazard mitigation faded, the mediated prospective memory practice of racing toward recovery emerged, arranging the 2012 and 2013 burn zones as competitors in a rebuilding contest. At the same time, discussions of causal policy problems waned and shifted focus from systemic issues such as WUI growth to ongoing investigations of individual ignition sources. This result partly aligns with studies from Australia which find returning to "normal" to be a common post-disaster theme, and which also find "little discussion of learning" after disasters (Bohensky & Leitch, 2014; Leitch & Bohensky, 2014, p. 24). The contribution of this study's sampling methodology, however, is that it reveals a more intricate pattern: the *appearance* of critical reflection about learning and adaptation during wildfire anniversaries (especially the first, and particularly with recurring fires) and a *decline* of the same discourse over time.

Conclusions and future research

The anniversaries of catastrophic wildfires appear to serve as important timeframes for critical reflection on wildfire causality and hazard mitigation in local media, especially first anniversaries and particularly when wildfires recur in close succession in the same community. Learning and adaptation discourse in local media commemorations of wildfire focused on causal policy problems, invoked hindsight as foresight, and recognized a new normal. It faded in later anniversaries, however, as local media shifted attention to comparing rebuilding rates among burn zones. These findings apply Tenenboim-Weinblatt's (2013) concept of mediated prospective memory to disaster media studies and contribute to learning and adaptation theory.

While we have contributed to the literature in meaningful ways through this analysis, this research could be further developed in several ways, a few of which have already been mentioned above. Future research should investigate whether the findings about learning and adaptation discourse from this study appear in larger media datasets, at other types of recurring or simultaneous socio-natural disasters, and at major later anniversaries. Future studies should also assess learning and adaptation discourse in community contexts besides local media, such as planning commission and homeowners' association meetings. Experimental or survey methods could also be used to examine media effects on public agenda-setting, particularly in the context of hazard mitigation funding and individual mitigation behaviour.

Notes

1. The WUI is the area where homes and associated structures intermingle with fire-prone wildland vegetation.
2. The Front Range extends along the eastern foothills of the Rocky Mountains and includes five substantial cities plus many smaller communities.

3. O'Neill and Handmer (2012) argue that risk management is “disproportionately loaded onto householders” in Australia (5). The proper ratio of the “shared responsibility” framework is an important question that is beyond the scope of this analysis.
4. Colorado Springs and Fort Collins are 130 miles apart.
5. Articles were gathered via ProQuest for the *Denver Post* and from online archives of the *The Gazette* and *The Coloradoan*.
6. A small number of articles included multiple policy problems. For these, the primary policy problem was determined and coded.
7. To ensure consistency and reliability of (a) the organizing of policy problems under common topics, and (b) the binary sorting of policy problems into “causes” and “symptoms,” two coders conducted post-hoc reliability tests using a random subset of articles (10%) and achieved full agreement after one round of coding and discussion.
8. Both fires started in June and burned intensively throughout that month.
9. The anniversary sample included 49 articles written by a total of 28 journalists. One journalist in particular (Ryan Handy) wrote 10 of the articles (24%), 3 of which are mentioned in the results. Because these three stories are intermixed with stories written by several others, we argue that our findings transcend the reporting style of this individual journalist. As we discuss later in the article, however, we believe it is important that future research engages with larger media samples to minimize the potential effects of individual reporters and editors on results.
10. After the 2002 Hayman Fire, Colorado Springs banned wooden roofing materials for re-roofing projects and new construction. After the 2012 Waldo Canyon Fire, the city also began requiring double-paned windows, attic vent screens, and non-combustible decking materials for new WUI construction or renovations.

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