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RESEARCH ARTICLE

What Do Extreme Weather Events Say About Climate Change? Comparing Politicization and Climate Policy in U.S. Wildfire and Hurricane News Coverage

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ABSTRACT

The increasing intensity of wildfires and hurricanes signal the reality of climate change, drawing media coverage that could capture the attention of policymakers. In a computational content analysis of 8906 news articles from four national newspapers, we compare coverage of wildfires and hurricanes in the U.S. from 2016 to 2021 examining volume and references to climate change, policy, and politicization. Our findings show patterns that provide new insight into how media may impact policymaking addressing climate change challenges. We find greater mentions of climate change in wildfire news coverage, suggesting that journalists more often associate wildfires with climate change than hurricanes. Volumetric data suggest a potential normalization effect implying decreased media attention of these events could reduce support for subsequent policy action. Overall, however, we do not see evidence that wildfires and hurricanes are focusing events for climate policy. We further discuss the implications of our findings, raising several questions and suggestions for future research.

KEY POLICY HIGHLIGHTS

- Climate change is more often mentioned in mainstream national U.S. news media connected to wildfires, while economic factors are more associated with hurricanes. Related policy may be more accepted when framed accordingly.
- Because less media attention may be paid to hurricanes and wildfires over time, as the novelty and dramatization factors diminish, the likelihood of their presence on policy agendas may be reduced.
- Recurring extreme wildfires and hurricanes may become expected by the public, policymakers, and news media. Normalization would mean extreme hurricanes and wildfires won't fit the definition of focusing events, suggesting that these events would not affect the policy agenda.

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Climate change; extreme weather; wildfires; hurricanes; news media; policy

Introduction

Extreme weather events, such as wildfires and hurricanes, are becoming increasingly common and intense phenomena in the United States (U.S.) and signal the reality of climate change. As the intensity of these events increase, so does media coverage about them. In the U.S., efforts to meet the expectations of the Paris Agreement to reduce greenhouse gas emissions have been historically considered "insufficient" (Climate Action Tracker, 2022). While recent U.S. federal legislation such as

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the Inflation Reduction Act (IRA) included many energy-related measures to reduce greenhouse gas emissions (H.R.5376 – 117th Congress (2021–2022): Inflation Reduction Act of 2022), climate change remains a deeply polarized issue amongst political partisans, which is problematic, especially as wildfire and hurricane seasons in the U.S. have become progressively extreme and prolonged.

The past decade of wildfire seasons in the Western U.S. have grown larger, more frequent, deadlier, and more costly from seasons past (Union of Concerned Scientists, 2020). The Western U.S. experienced its most active wildfire season in 2020, with California recording five of the seven largest wildfires in its recorded history, burning over 4.4 million acres, with the top eight largest wildfires occurring between 2017 and 2021 (CAL Fire, 2021). The 2020 Atlantic hurricane season was equally record-breaking; the season was so active that the National Hurricane Center ran out of human names for the storms by September and continued alphabetically with the Greek alphabet (Whang, 2020). Overall, the U.S. experienced a year of record-breaking costly events in 2020, with seven tropical hurricanes and one wildfire event costing over $1 billion in damages each (NOAA, 2021).

As each wildfire and hurricane season intensifies, so too does the resulting media coverage. The news coverage of extreme weather events and decisions to connect these events to the changing climate can impact the public and policymakers alike, resulting in support for or opposition to response efforts, funding, and potential policy changes. News coverage of extreme weather events are increasingly being connected to climate change (Hopke, 2020), where coverage of certain issues can influence public attention and opinions towards those issues (see Perloff, 2022 for an overview). This media agenda-setting function is also a component known to influence which issues make it on the agenda of policymakers (Kingdon, 1995). Disaster events, like wildfires and hurricanes, can thus have broader policy impacts, depending on how much attention the media gives to the issue (Birkland & Schwaeble, 2019; Crow et al., 2017). However, disaster response and mitigation funding allocation in the U.S. is complicated – several federal agencies, as well as state and local governments, provide patch-work reactionary disaster relief rather than systematically building resilience (e.g. Kane et al., 2021). So, while it is not necessarily clear that extreme events result in policy outcomes, examining news coverage of extreme events can provide insight into the potential into how climate-related issues arrive on the climate mitigation and adaptation policy agenda.

This research explores news coverage of wildfires and hurricanes in the U.S. from 2016 to 2021 through a computer-assisted content analysis of national newspaper coverage, to examine frequency and mentions of climate change, policy, and politicization. Climate change is a dynamic issue that requires consistent examination, especially as a polarized political issue in an era of ever-evolving media environments. We find that hurricane coverage is greater in volume and episodic in nature, while wildfire coverage gradually increased as seasons have become more frequent and costly, and more often includes mentions of climate change. These findings indicate that media coverage alone does not provide adequate evidence that wildfires and hurricanes act as focusing event for climate policy – but rather indicates a potential normalization effect. Additionally, coverage is not overly politicized, which is promising for avoiding unnecessary partisan polarization regarding mitigation or adaptation policy efforts targeted at climate-related disasters. Overall, this study provides a novel exploration into the relationship between media coverage of climate-related extreme weather events and broader policy – examining the utility of agenda setting and focusing events as operationally relevant concept for this complex issue.

Setting the agenda: exploring the media-policy link

The influence of news media on public opinion for various issues has been widely explored. Agenda setting theory posits that "issues emphasized in the news come to be regarded over time as important by the public" (McCombs, 2004, p. 5). It is understood that through agenda setting, the media influences what is made "salient in people's minds" by emphasizing specific information about

particular issues that captures public attention (Scheufele & Tewksbury, 2007, p. 11). Media plays a pivotal role in determining what the public and policymakers pay attention to and care about, depending on topic, information presentation, and format (Nisbet et al., 2003). The implication here is that public opinion, which is heavily influenced by media, also influences the policy agenda. In other words, the relationship between media and policy is dynamic and mutually influential; media affects and is affected by the policy process and policy agenda setting (Atkinson et al., 2014; Kingdon, 1995). And since the policy agenda determines which policy issues become priorities in the legislative process (Kingdon, 1995), media influence on public opinion potentially shapes policymaking priorities. In this study, we explore the relationship between the media agenda and the policy agenda related to extreme weather events and climate change.

Due to the nature in which they ignite and rapidly spread, wildfires and hurricanes are disasters that have "significant impacts on human interests, including life and property" and receive a lot of attention both from the public and political elite (Crow et al., 2017). Therefore, these events may have a direct influence on reactive policy. When disasters occur, any existing policy thought to have played a role in exacerbating current disasters or will aid future disasters typically rises on publics and media agendas (Crow et al., 2017). Previous research has explored how wildfires can open a "policy window" that leads to local policy changes when considered novel and when resources such as funding and staff capacity exist (Mockrin et al., 2018). However, the same study finds that locations with long histories of destructive wildfires, previous failed attempts at regulation, and limited resources see less resulting policy. This could be due to the normalization of wildfires as they become more frequent in certain regions. In relation to the concept of the "risk society," normality is concerned with the situation in which "the *state of emergency* threatens *to become the normal state*" (Beck et al., 1992, p. 79, emphasis in the original). In this sense, normalization of attitudes and expectations towards extreme weather events may occur as the changing climate increases frequency of these events.

On the other hand, due to the increasing intensity of climate-related extreme events, they may still increase public attention to the effects of climate change. Events that are sudden and attention-grabbing that cause harm in particular geographic regions, are relatively uncommon, and are recognized by both policymakers and the public simultaneously are known in the policy space as "focusing events" (Birkland, 1998; Kingdon, 1995). Focusing events can be thought of as a way to highlight the influence of media on the policymaking process. For environmental disasters to be considered a focusing event, the subsequent media agenda will contain a greater volume of news coverage about the disaster (Baumgartner & Jones, 1993). Focusing events can be useful for stakeholders interested advancing issue agendas or for mobilizing interest group influence on the policy agenda (Birkland, 1998). Hurricanes and wildfires could influence broader climate policy if there is subsequent mobilization that pressures policymakers to seriously consider climate change for the policy agenda.

While there is scientific consensus that human-induced climate change has led to an increase in "frequency" and "intensity" of extreme weather (Masson-Delmotte et al., 2021), this connection changes based on the type of event, how it's defined, measured, and its geography (Clarke et al., 2022; Stott et al., 2016). This becomes further complicated when extreme weather is declared as a disaster, which is based more on pre-existing socio-economic and political factors than physical properties (Lahsen & Ribot, 2022). For example, the probability of high wildfire risk and acres burned is explicitly linked to human-induced climate change (Kirchmeier-Young et al., 2019), whereas linking climate change's impacts on hurricane frequency and intensity is less straight forward (Meyer, 2022a). Due to this, hurricanes and wildfires may be connected to climate change in news differently, potentially creating trade-offs for societal and policy discourse (Hai & Perlman, 2022).

Measuring the impact of media attention by volume

To understand the potential influence that media coverage can have on the policy agenda, we examined the volume of media coverage of wildfire and hurricane events between 2016 and 2021.

Measuring media attention by volume or frequency is a common method for agenda-setting research (Kiousis, 2004), where many studies have examined media coverage of climate change with respect to the "issue attention cycle" (e.g. Brossard et al., 2009; Feldman et al., 2017; Schmidt et al., 2013). The issue attention cycle, coined by Downs (1972), presents the relationship between public attention and societal issues as cyclical. The model explains the rise and fall of interest from publics regarding specific events or issues, as the policymaking process associated with the issues becomes more complex (Holt & Barkemeyer, 2012). This approach is especially useful for understanding how issue coverage evolves over time and relates to broader public opinion and policy action. Similarities have been drawn between the issue attention cycle and focusing events, with the key difference indicating policy change rather than public opinion (DeLeo et al., 2021).

Previous research has collected volumetric data to understand and compare coverage trends on various topics, from emerging technologies (e.g. Cacciatore et al., 2012) to diagnostic testing during the 2009 H1N1 pandemic (Olowokure et al., 2012). Volumetric comparisons of climate change media coverage have examined coverage across a range of countries over time (e.g. Schmidt et al., 2013). For disaster coverage, one study finds greater volume of social media discussions during hurricanes than wildfires, with social media mentions rapidly falling after hurricanes make landfall and long before wildfires are officially contained (Olynk Widmar et al., 2021). The largest volume of traditional media coverage of wildfires, on the other hand, often occurs during the event when risk is immediate and is considered a public source of information to define and respond to the event (Paveglio et al., 2011). Because we are interested in examining volume as an indication of media attention and agenda-setting, our first research question **(RQ1)** asks:

> How does the volume of media coverage of hurricanes and wildfires in the U.S. compare over time (2016-2021)?

Differences in news coverage of extreme weather events

In comparing wildfires and hurricanes there are some similarities and several differences that influence how these events are covered by the mainstream media. In the U.S., coverage of environmental topics like climate change or extreme weather tends to adhere to journalistic norms such as *personalization* – focusing on single occurrence surface-level events, *dramatization* – overemphasizing crisis over continuity, and *novelty* – covering a new event rather than chronic issues (Boykoff & Boykoff, 2007). More reporting and attention are typically paid to extreme weather events directly after they start, to the economic damage caused, and when event is abnormal compared to past events (Sisco et al., 2017). Media has the power not only to report on these events, but also to create and define them by giving them memorable names, focusing on certain details over others, and deciding how long to cover them (North & Bainbridge, 2010).

When reporting on wildfires or hurricanes, important physical, material, and temporal differences include the characteristics of the event, geographic region, and affected populations. For instance, wildfires are unpredictable, slow-moving nature, tend to burn for long time periods, and lend themselves to spectacular media images. Large wildfires also typically burn in the Western U.S. ecoregions during increased temperatures, drought, and windy conditions, often further from high density population centers (Dennison et al., 2014; Jolly et al., 2015). Hurricanes, on the other hand, produce strong winds, storm surge flooding, and extreme rainfall; they are tracked and spotted quickly, make landfall or don't, and then pass (NOAA, 2020). Depending on the location and if storm makes landfall, hurricanes can bring a variety of unique and life-threatening hazards, with 88% of hurricane related deaths in the U.S. attributed to water hazards such as storm surge (Rappaport, 2014). When Atlantic hurricanes make landfall in the U.S., they typically impact high-density population centers along the Gulf and East coasts.

News coverage trends for wildfires and hurricanes also differ. Wildfire coverage has often been devoted to the threat of private property (Paveglio et al., 2011), focused on the cause of the fire and

its escalation, or on the management of the crisis (Nilsson & Enander, 2020). News coverage of hurricanes typically frame stories as "actions to take to prevent risk" followed by "anticipated damages" (Choi & Lin, 2008). To explore the differences of news coverage for wildfires and hurricanes, we explore the second research question (**RQ2**):

> What topics appear throughout the media coverage of hurricanes and wildfires over time?

Connecting extreme weather to climate change and policy in disaster news coverage

The increasing intensity of hurricanes and wildfires can be partially attributed to impacts of climate change, yet these associations are not always top of mind. Scholarship examining the relationship between extreme weather events and climate change in news media is also lacking; arguments have been made that "researchers need to study how media represent environmental risk" impacted by climate change (Hopke, 2020, p. 7). Further, while climate policy is gaining momentum at the federal level, policy addressing the impacts of increasingly extreme weather events is still needed. Examining how climate change is presented in news coverage of hurricanes and wildfires is one step that supports research in this emerging space.

The association between extreme weather events and climate change is not consistent across events. Although climate change has been historically ignored in news stories of wildfires (Cordner & Schwartz, 2019), it is likely becoming easier and more common for both the media and those living in these regions to explicitly connect wildfire events to climate change (Hopke, 2020). Recent work examining connections to climate change in news coverage of extreme heat and wildfires around the world found an increase in climate mentions and media coverage between 2013 and 2018 (Hopke, 2020). In comparison, the link between hurricanes and climate change is less linear and thus more difficult to make, as worsening hurricanes are the result of rising ocean temperatures, which might not be noticeable in day-to-day experiences (Battistoli et al., 2018). Previous research has shown that various factors influence how extreme weather events are associated with climate change in media, including geographical and cultural proximity/distance, news values, and national ideology and knowledge surrounding climate change (Berglez & Lidskog, 2019). Regardless of what might impact whether journalists make these associations, doing so could influence how policymakers and the public view the importance of climate change as a policy issue.

While an analysis of media coverage cannot produce direct causal connections to subsequent policy, previous work does find links between mass media coverage and climate governance across national and cultural contexts (e.g. Ejaz et al., 2023; Stoddart & Tindall, 2015; Takahashi & Meisner, 2014; Tindall et al., 2018). In the U.S., policy processes and funding for disaster response and mitigation is complicated. While many likely consider the Federal Emergency Management Agency (FEMA) as the main federal entity that responds to disasters, it is one of several federal agencies responsible for relief and resilience efforts – not to mention local, state, and non-profit efforts that often also respond (e.g. Frank et al., 2021; Meyer, 2022b). Recent research shows that support for federal environmental spending increases with greater occurrences of extreme weather events, explaining that such events act as "effective policy images signaling the need for more investment in combating climate change" (Soni & Mistur, 2022, p. 9). While it is unclear whether these respondents were influenced by extreme weather news coverage, these findings indicate a positive directional influence between extreme weather events and policy support. Furthermore, analyses of federal disaster policies note that previous disasters have effectively opened policy windows, such as Hurricane Sandy leading to congressional appropriations (Frank et al., 2021), but do not discuss the role of media coverage.

Given the complexities surrounding disaster response policymaking, finding connections between extreme weather events and broader climate policies likely involves many, potentially overlapping, components. One indication of this connection could be how news coverage of these events that not only associates extreme weather with climate change, but also specifically highlights climate

policy beyond disaster response. To examine how hurricane and wildfire news coverage represents climate change and policy, our third research question (**RQ3**) asks:

> How often are keywords associated with climate change and policy in general referenced in news coverage of wildfires and hurricanes, and how does that change over time?

Examining levels of politicization within extreme weather news coverage

Within a politicized media system, coverage of climate change has become increasingly politicized and partisan at both national and regional levels (Chinn et al., 2020; Merkley & Stecula, 2018). Decades of partisan divides over climate change and related news coverage can be traced back to individual-level factors such as ideological and partisan preferences (Bohr, 2020; Bolsen & Shapiro, 2018). Due to this, media coverage of extreme weather events, especially if explicitly connected to climate change, may fall into partisan divides. In certain U.S. political-geographic regions, there is a culture of science denialism surrounding climate change among some politicians, which influences media coverage and policy decisions (Howe et al., 2015).

However, U.S. partisan news environments produce coverage of events that are unlikely to have "across-the board agenda-setting effects" causing an "agenda divergence, or the rise of multiple media agendas and corresponding issue publics" (Schmierbach et al., 2022, p. 509). In this sense, media agendas target specific audiences with resonant messages, which might result in perceptional differences among publics that form opinions from partisan news sources. This may be the case for disasters covered on the national scale – which could cause them to become politicized to the point of polarization. An analysis of climate change news coverage over time indicates that coverage of climate change is increasingly politicized (Chinn et al., 2020). The fact that climate change is a partisan issue has historically impeded climate change issues from making the policy agenda. In 2020, the Trump administration withdrew from the Paris Agreement and subverted climate related efforts and policies, contributing to the U.S. lagging behind national goals and on the global stage (Popovich et al., 2020). Additionally, despite the major climate allocations in the 2022 Inflation Reduction Act, not one Republican politician voted for it (Meyer, 2022c). Because politicization can have disastrous effects on policy, we explore politicization of disaster news coverage by examining the presence of partisan actors within coverage – in line with previous work that conceptualizes politization (e.g. Boykoff & Boykoff, 2007; Chinn et al., 2020; Feldman et al., 2017;). This leads us to ask our final, fourth research question (**RQ4**):

> Does news coverage of wildfires and hurricanes increasingly mention political parties and actors over time, and how do the parties compare?

Methods

To explore these four research questions, we conducted a quantitative content analysis of wildfire and hurricane news coverage in the U.S. from 2016 to 2021. A content analysis is "the systematic and replicable examination of symbols of communication and the analysis of relationships involving those values to describe the communication, draw inferences about its meaning and infer from the communication to its context" (Riffe et al., 2014, p. 23). Content analyses have been conducted to study a range of issues examining media influence of public perception, including climate change (e.g. Ford & King, 2015; Schmidt et al., 2013).

Data

We collected news articles from four U.S. national news outlets between 1 January 2016 and 31 December 2021: *The New York Times, the Wall Street Journal*, *the Washington Post* and *USA Today*. These national news organizations were chosen because they would be likely to cover

meta-level debates about wildfires and hurricanes connected to climate change and were available on an academic license of Factiva, the data collection research tool used. Articles were filtered using Factiva's "wildfire" and "hurricane" news subject categories. Duplicate and republished articles were removed, along with sports, calendars, obituaries, and market data.

Computational textual analysis

While there are multiple ways to conduct content analyses, we conducted a computer-aided textual analysis (CATA), relying on the *quanteda* package in R, a free, open-source software for statistical computing, to apply topic-specific dictionaries to the wildfire and hurricane news coverage collected (Benoit et al., 2018; Welbers et al., 2017). Computational methods and use of "big data" in communication research are increasingly common in content analyses. These methods typically involve large and complex "naturally occurring" data sets that require algorithmic solutions to analyze and the application of communication theory to make meaning (van Atteveldt & Peng, 2018). The dictionary approach uses computer software to count the proportion of words that indicate each category and its associated keywords, where words, instead of paragraphs, are the unit of measurement (Rooduijn & Pauwels, 2011). Dictionaries can be created deductively, by applying a pre-defined codebook or set categories in analyzing the data, or inductively, by creating new topics or categories that emerge from within the text itself (Günther & Quandt, 2016).

This study applies a combined deductive and inductive approach to create dictionaries, where we deductively applied three pre-existing dictionaries from research by Chinn et al. (2020), including "climate change," "Republican," and "Democrat" (see Table 1). The remaining two categories, "Economic" and "Policy/Management" were inductively created through use of the R package *stm*, or structured topic modeling (Roberts et al., 2019). This approach allowed us to find the most prominent topics and their associated keywords used in both wildfire and hurricane news stories, which the researchers clustered into two dictionaries. We then applied five dictionaries (see Table 1) to see how often keywords appeared in news coverage of wildfires and hurricanes.

Analysis procedure

To prepare the data for analysis, we ran script in Python, to convert the news articles to an open standard file format,.JSON. Then, we imported one wildfire set and one hurricane set into R and used *jsonlite* to convert these files into a raw text corpus using the *quanteda* and *readtext* packages. The *quanteda* package aids researchers in tokenizing articles into single word units, removing punctuation, stemming words, removing stop words, and making all words lower case using the document-term matrix *dtm* command. Finally, we conducted filtering and weighting, which removes words used too infrequently. To explore our first research question (RQ1), we performed analysis on the volumetric data with Excel (see Figure 1). To explore the remaining research questions (RQ2 – RQ4), we applied five dictionaries in R to identify specific themes in coverage including climate change, politicization (Democrat and Republican), economics, and policy.

Table 1. Dictionaries.

Dictionary	Words	Adapted from
Climate change	Global warming, climate change, greenhouse gas*	Chinn et al. (2020)
Republican	Republican*, GOP, conservative*	Chinn et al. (2020)
Democrat	Democrat*, liberal	Chinn et al. (2020)
Economic	Property, investor, economi*, billion, homeowner, home, house, insurance, rebuild, loan, price, reinsur*, mortgage	Stm, or structured topic modeling
Policy/ Management	Respons*, policy, legislation, FEMA, management, disaster respons*	Stm, or structured topic modeling

Note: Keywords ending with an asterisk also captured plural forms.

Findings

The findings of this comparative study show major differences in the attention paid to wildfire and hurricane events with U.S. national news coverage from 2016 to 2021. To answer the first research question (**RQ1**) regarding the total volume of wildfire and hurricane news coverage and how this compares over time, there was a total of 8906 articles ($N = 8906$), with 3191 wildfire articles ($n = 3191$), comprising of 36% of total coverage during this period and 5715 hurricane articles ($n = 5715$), or 64% of total coverage (see Figure 1).

Along with a larger overall volume of hurricane news articles, there were also significantly more per year, especially during the extremely active and costly seasons of 2017 and 2018 when several prominent hurricanes, such as Irma, Harvey, and Maria impacted the Southern and Eastern U.S. and Puerto Rico. On the other hand, total volume of wildfire news coverage steadily increases year over year to 2020, as wildfire seasons across the Western U.S. increase in size, intensity, and deadliness. The leveling off from 2020 could be due to many things, such as normalization of these events or competing media agenda issues, like COVID-19.

We examined results from the dictionary analysis to address our second research question (**RQ2**), which asked what topics appear throughout the media coverage of hurricanes and wildfires overtime. We found, as summarized in Table 2, that for hurricane news coverage, economic terms appear most proportionally year over year, followed by policy terms. For wildfire news coverage, economic terms also appear the most proportionally, but policy and climate mentions also appear frequently, especially between 2019 and 2021. The prevalence of economic terms highlights an expected emphasis on the cost of these events, signaling a focus on adaptation measures and response efforts; such outcomes may require policy action.

To address research question three (**RQ3**), which asks how often keywords associated with climate change and policy are referenced, and how these change over time, we find that the proportional mentions of climate change were significantly higher in wildfire news coverage compared to hurricane news stories overall, with the largest gap in mentions in 2020 (see Figure 2). Policy mentions increase sharply in 2017 for both, with hurricane coverage spiking in 2018 and leveling off, eventually becoming nearly even with wildfire coverage mentions of policy from 2019 to 2021 (see Figure 3).

Finally, to address the last research question examining mentions of Republican and Democrats (**RQ4**), we find that news coverage of both hurricanes and wildfires in the U.S. do not become

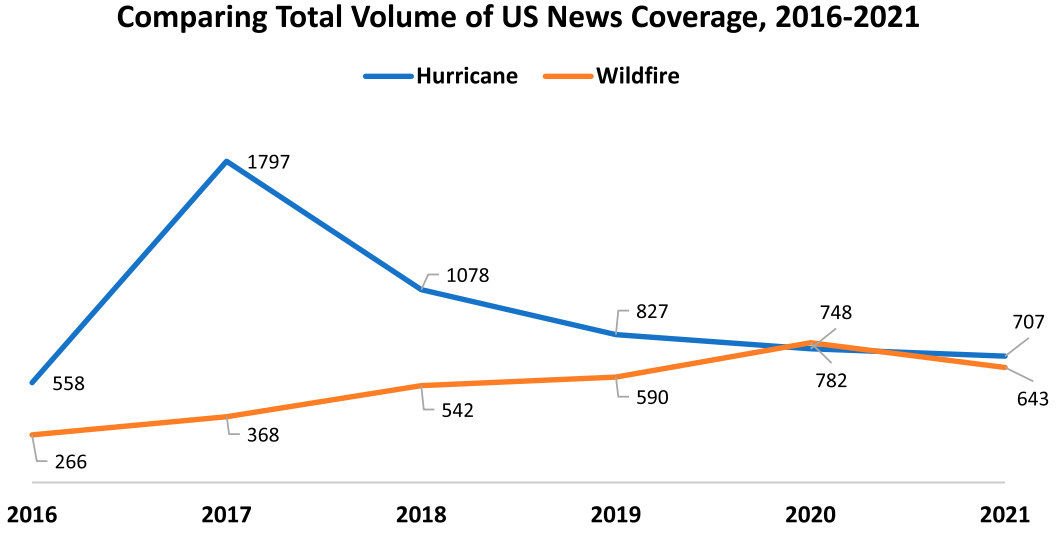

Figure 1. Comparing total volume of U.S. news coverage of wildfire and hurricane stories from 2016 to 2021.

Table 2. Dictionary results: percentage of total coverage by category, year and event.

	Hurricane					
	2016	2017	2018	2019	2020	2021
Economic	226%	499%	437%	309%	301%	347%
Policy	80%	201%	222%	128%	139%	123%
Climate	30%	42%	54%	53%	61%	94%
Republican	27%	52%	37%	37%	33%	14%
Democrat	21%	26%	35%	39%	24%	18%
	Wildfire					
	2016	2017	2018	2019	2020	2021
Economic	29%	417%	349%	422%	312%	299%
Policy	11%	127%	132%	152%	141%	130%
Climate	5%	50%	74%	107%	158%	130%
Republican	1%	30%	19%	21%	28%	23%
Democrat	0%	15%	21%	32%	31%	23%

Note: % total represents the number of mentions for each dictionary topic by the total number of articles in the sample for hurricanes and wildfires, respectively.

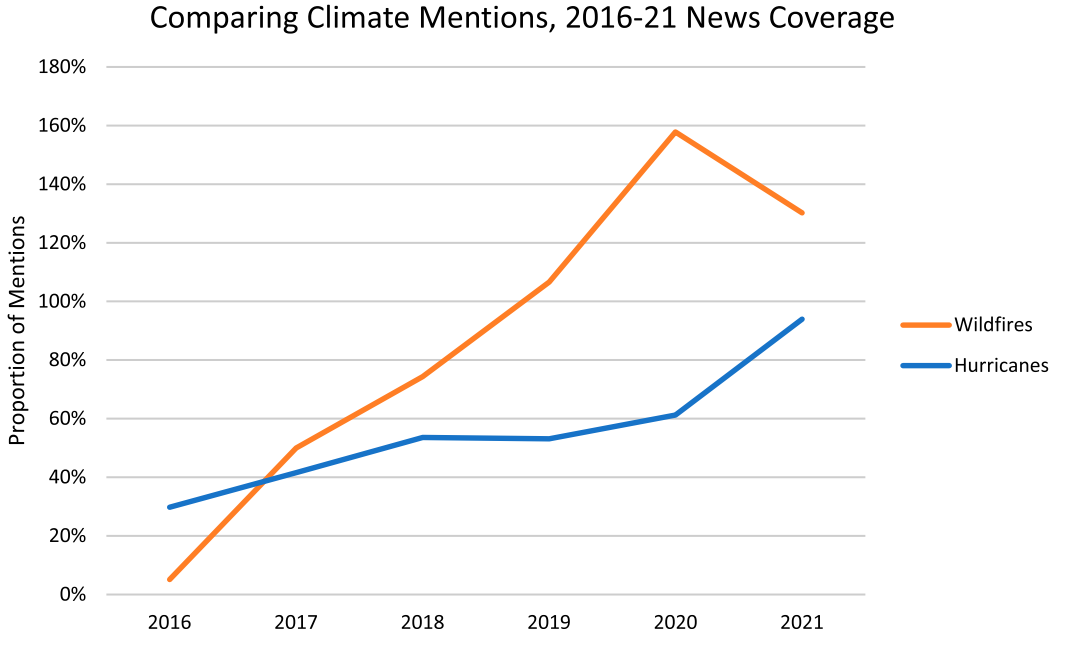

Figure 2. Comparing proportional mentions of climate change in U.S. news coverage of wildfire and hurricane stories from 2016 to 2021.

increasingly politicized over time. In 2016, mentions of politics are virtually absent from wildfire coverage. Then in 2017, Republican mentions spike in both wildfire and hurricane coverage. From 2018 to 2020, mentions of Republicans, while still higher, begin to fall year over year, while mentions of Democrats slowly rise. A lack of politicization is promising for guarding against partisan polarization of extreme weather events that could stifle policy action (Figure 4).

Discussion

Given that greater media attention of an issue can increase policy action (Wolfe et al., 2013), we conducted a media analysis of extreme weather to examine if we could make inferences

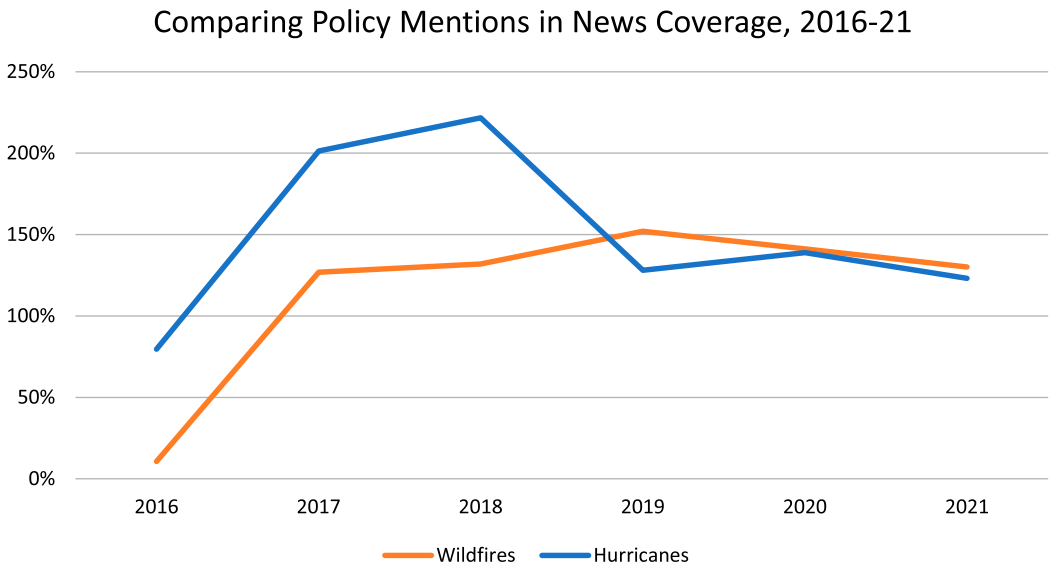

Figure 3. Comparing proportional mentions of policy in U.S. news coverage of wildfire and hurricane stories from 2016 to 2021.

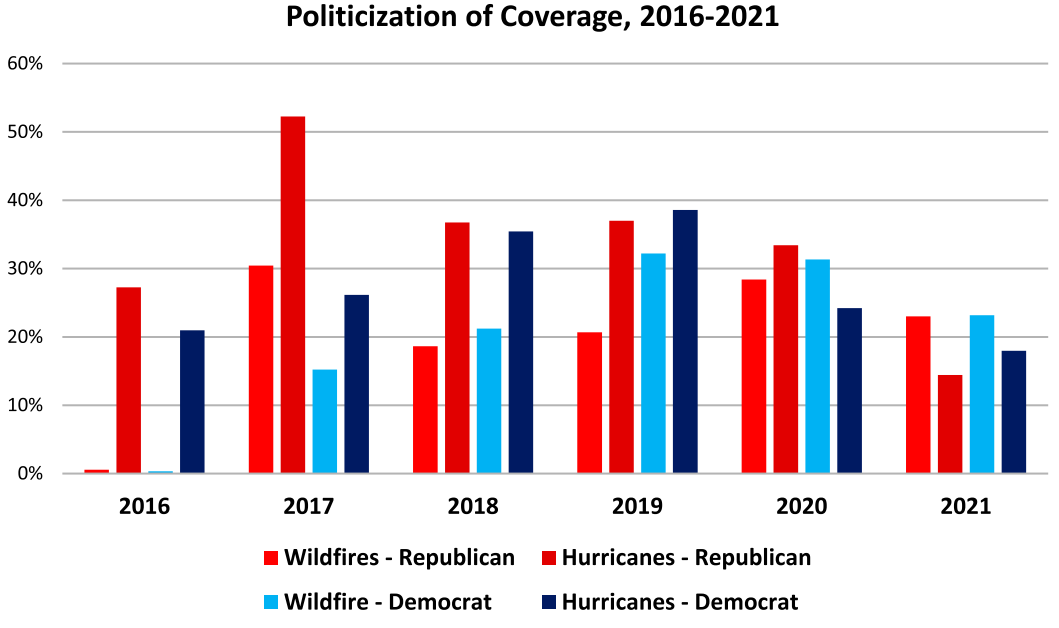

Figure 4. Comparing proportional mentions of Republican and Democrat in U.S. news coverage of wildfire and hurricane stories from 2016 to 2021.

about climate policy. Specifically, we explored how U.S. news media covered wildfires and hurricanes from 2016 to 2021 in the context of climate change, policy, and politization. Our findings indicate key differences that may provide insight into whether these extreme weather events and their subsequent media coverage could potentially be focusing events for climate change policy, if there is potentially a normalization effect occurring, and whether they are politicized issues.

Extreme weather might not be focusing events if they become the norm

Our analysis of volumetric data shows a large spike in news coverage of hurricanes in 2017 and 2018, which may be an indication that these novel seasons were more likely focusing events than other years (**RQ1**). This aligns with previous research that connects the 2017 hurricane season to the opening of a policy window that that ushered in the 2018 Disaster Recovery Reform Act and it's "innovative new initiative, the Building Resilience Infrastructure and Communities program" (Frank et al., 2021).

However, in 2020 and 2021, news attention was similar across both wildfires and hurricanes, potentially suggesting a ceiling effect for disaster journalism – when the coverage may have more of a limited effect because the population is near a saturation point (Judson, 2012). Perhaps the annual reoccurrence and extended seasons of extreme events in the U.S., exacerbated by climate change, normalizes them and makes them less likely to be focusing events. If this is the case, this volumetric data has potential policy implications for climate-related disasters: the more a type of event occurs over time, the less media attention it may receive because the novelty and dramatization factors are no longer present. Thus, despite the increased intensity of these storms, as they become recurring, standardized, and expected, both the public and policymakers will become more accustomed to them, and they will no longer fit the definition of a focusing event. This could negatively impact efforts to create adaptation and mitigation policy to address the challenges of climate change related to extreme weather.

At the same time, given the corroborated disaster response efforts across federal agencies, state and local governments, and nonprofits, what might look like normalization could also represent effective adaptation and response efforts. More research is needed to better understand the relationship between the fragmented disaster response system in the U.S. and broader climate policy. The leveling off of coverage could also be due to co-occurring current events and crises, such as the COVID-19 which dominated media agendas across platforms in 2020–2021.

The connections of climate change and the implications of (the lack of) politicization

The dictionary analyses show that climate change was the only theme more prevalent in wildfire news coverage (RQ3), regardless of total volume of articles. Journalists at national newspapers seem to be willing to make direct and explicit connections between climate change and wildfires than they do with hurricanes. As discussed, perhaps this is due to the differences in psychological distance to climate change on temporal, social and geographical dimensions of each extreme event (Spence et al., 2012). For example, the experiences of warmer temperatures, drought, strong winds, and wildfire might be more salient to affected publics and thus easier for journalists to connect to climate change than the rising temperature of the ocean.

Hurricane coverage tends to be more heavily politicized and mention Republican actors more frequently than Democrats (**RQ4**). Looking at this by year, it seems clear that geographical location of hurricanes (South/Eastern U.S.) and wildfires (Western U.S.), as well as political party of the presidential administration play a role in politicizing news coverage. Thus, politicization is likely due to who holds office where these events occur, rather than indicating overly politicized coverage – which could lead to partisan polarization of extreme weather events. Polarization of issues can directly impact the success or failure of federal policy due to congressional gridlock and thus should be avoided when possible. News analyses can help determine the status of politicization and potential avenues for alternative messaging. Our analysis also shows politicization spiked early in a new presidential administration and then leveled off towards the end. This could also be influenced by co-occurring national events (e.g. COVID-19), which our analysis does not capture.

Insights from news coverage analyses for broader policy implications

This research may have important implications for policy and management of extreme weather events, which continue to grow more costly, deadly, and extreme due to the climate change. The

news coverage of hurricanes and wildfire events during the time of our study emphasized economic impacts like costs related to damage to property and insurance coverage (**RQ2**). This makes sense given that the aftermath of these events often impacts individual homes and can create financial hardship (e.g. Meyer, 2022b). Although policy terms appeared the second most frequently for both event types, it's not clear that these events function as focusing events for broad national climate policies.

Thus, it's not that extreme weather events are not garnering enough attention to be focusing events, but rather that the relationship between our media systems and policymaking processes are inherent complex and non-linear. For instance, the ever-evolving news environment has become increasingly fragmented and plays less of a gatekeeping function since the introduction of algorithmic news curation (Scheufele et al., 2021). This evolving news environment has shifted the agenda setting process, which calls into question how relevant the agenda setting framework is for understanding the influence on policy processes. In fact, recent calls for the evolution of agenda setting research highlight considering various contextual news factors that contribute to public opinion and policy action (Schmierbach et al., 2022). Furthermore, it has been argued that understanding how "a focusing event can yield policy change is complex" and examining the dynamics of these events is underdeveloped (Birkland & Schwaeble, 2019). Research is mixed regarding how experiencing extreme weather events influences policy support, with some work finding no influence in various countries (e.g. Nohrstedt et al., 2021), while others find marginally significant relationships for support for federal funding (e.g. Soni & Mistur, 2022). There is clearly more here to understand and using our approach, isolates specific questions, allows for future research to uncover additional parts of the larger picture.

To extend our study, future research could take a triangulated approach using multiple data sources to provide a more complete and nuanced analysis, including state and federal disaster spending by year, or public opinion data including if individuals connect extreme weather events and climate change. Additionally, focusing events are typically geographically bound and support for climate policy can be shaped by personal experience with extreme weather events, so it's important to consider the effect of regional media coverage (Borick & Rabe, 2017). Lastly, increased citizen engagement on climate change issues is also correlated with a rise in media coverage that makes connection between climate and natural disasters (Dixon et al., 2019). Thus, future research could explore local and regional media coverage of natural disasters in tandem with state or city level policy responses to illuminate how focusing events prompt policy windows on localized contexts.

We acknowledge that this study has limitations. This study examined only two types of extreme weather, which are different in physical, material, and temporal natures, and impact different regions and populations. Due to this, the comparative element is not exactly matched. Therefore, it would be beneficial to include and examine multiple types of extreme weather events and disasters to contextualize the trends seen in these findings. Additionally, due to availability constraints for the database Factiva, we had limited selection of news outlets and were not able to include additional geographically appropriate, regional, or smaller newspapers in the study. Lastly, we acknowledge that this only work analyses data from a five-year period and longer stretches of disaster news coverage should be examined in the future to understand if trends of ceiling effects and normalization hold long term. Future analyses would benefit from expanding the time period of data collection and expanding our analyses into the broader public discourse surrounding these types of events, such as within social media.

Conclusion

As wildfires and hurricanes will continue to impact U.S. populations, policy actions in the form of increased preparation and adaptation measures are needed. Thus, it is critical to understand how media coverage can influence both public opinion and the policy agenda surrounding these events. This study provides a starting point to making the connections between media coverage and climate

policy known. Furthermore, this study contributes to broader literature of climate change in media and focusing events by narrowing in on wildfire and hurricane coverage from 2016 to 2021 as a comparative case. The similarities and differences of the news coverage studied show that climate change is being more directly invoked in media coverage of wildfires and not hurricanes. Our analysis by year allows us to see if national news coverage may be influenced by outside factors such as the size, scale, and severity of the extreme weather events that occurred in a year, or the presidential administration at the time. These speculations underscore, however, that definitive conclusions about wildfires and hurricanes as focusing events cannot be made by this study alone. As the effects of climate change are increasingly felt at local levels, it is imperative that the resulting media coverage also highlights the importance of a broader national and global climate policy towards mitigation and adaptation efforts. Given the influence the media can have on the policy agenda and public opinion, how both national and regional media outlets choose to cover climate change disasters, like wildfires and hurricanes, could have lasting policy impacts on affected communities.

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