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Not All Disasters are Created Equal: Evaluating Differences in Fire and Hurricane Media Coverage

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Introduction

- Studies have shown that the public's perception and engagement in conservation behaviors often follow media coverage[1] Water quality issues are of major concern during natural disasters, but little is known about how these issues are portrayed in the media across different types of disasters.
- Using a social-theory guided approach, this research attempted to predict coverage of water-related concerns in the context of fires, wildfires, and hurricanes through the examination of the 'news values' of proximity (e.g. physical proximity to populace) and magnitude (e.g. size and impact).
- News values are metrics used by news organization to gauge the interest of their readership in a story, and the news values of proximity and magnitude have been found to predict coverage of natural disasters in previous research[2].

Study Objective: Using a corpus of 676,354 newspaper articles, we evaluated: 1) whether newspaper coverage of water-related concerns for fires and hurricanes were reported on equally and 2) how the news values of proximity and magnitude affected this relationship.

Hypothesis

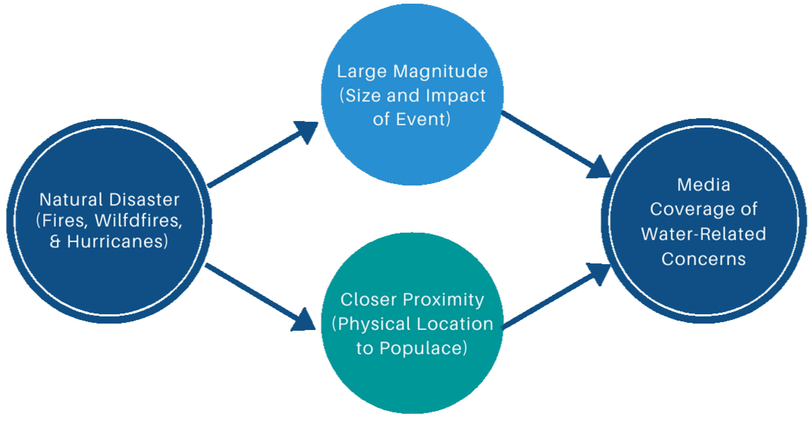

Figure 1. Factors that influence media coverage of water-related issues during the course of a natural disasters.

Methods

Newspaper articles: topic-modeling filtered corpus of water-related local newspaper articles

Magnitude metrics: for fires, state-level disaster declarations, number of fires, and fire-related deaths and property losses. For hurricanes, metrics included state-level declarations, number of hurricanes that made landfall, associated deaths, and damage.

Proximity metrics: A wildfire case study investigated geospatial variations in newspaper coverage. Two primary methods were used:

1) geographic metadata within newspapers
2) spatial autocorrelation techniques

Results

Approximately 24% of the water-related articles from local newspapers discussed fires and hurricanes. The newspaper articles were distributed across 32 local U.S. newspapers across 31 U.S. states (Figure 2) and span between Dec 1997 and Dec 2017.

Figure 2. Map of Newspaper Articles. Newspaper sources considered were constrained by availability of associated articles through the LexisNexis database.

Fires generally received more coverage than hurricanes, with coverage decreasing almost steadily since 2000 (Figure 2). Hurricane coverage exhibits a cyclical pattern with peak coverage occurring in 2005 and again in 2017 (Figure 3).

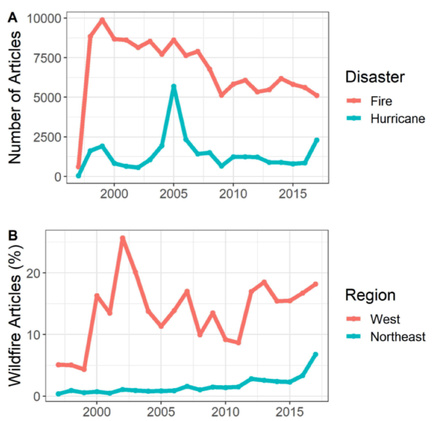

Figure 3: Annual Disaster Coverage Over Time. More articles were published for fires than hurricanes (A) while regional variations in coverage are observed in wildfire-related coverage (as a percentage of fire articles) (B).

The number of articles that discuss water issues during hurricanes correlated positively with all associated magnitude metrics, from disaster declarations to total events and event-related deaths and loss (Table 1). For event-related loss and deaths, a weak negative correlation for fire metrics and associated coverage is observed (Table 1).

Metric	Fires	Hurricanes
Disaster Declarations	0.16 (0.60)	0.56 (0.03)
Total Events	0.16 (0.60)	0.36 (0.18)
Event-Related Deaths	-0.07 (0.79)	0.45 (0.07)
Event-Related Loss	-0.20 (0.48)	0.52 (0.13)

Table 1: Correlation between Coverage and Disaster Events. Analysis was conducted for 10 years, from 2008 to 2017. Values represent Kendall correlation-values: τ, with p-values in parentheses.

Wildfire Case Study

Generally, fires in the West are more frequent, occupy larger areas, last longer, and are more likely to be declared as disasters then fires in the Northeast. It also receives more coverage, with a slightly negative sentiment used in the article's tone (Table 2).

Annual Averages	Northeast	West
Disaster Declarations	3	35
Number of Articles	4.4	26.9
Article Length (1000 characters)	22.3	11.4
Article Sentiment	-0.03	-0.03
Number of Wildfires	138	876
Fire Size (Acres)	8.5	211.9
Fire Duration (Days)	4.2	8.1
Fire within WUI (%)	43.4	13.1

Table 2: Summary statistics of wildfire coverage and events. Generally, the West has more wildfire events and more media coverage than the Northeast.

Another distinction between the regions are the underlying causes of the fires; more fires have human causes in the Northeast than in the West (Figure 4).

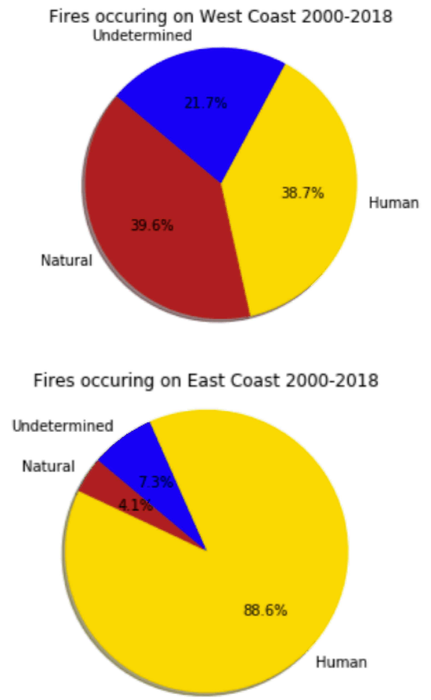

Figure 4: Causes of Wildfires between 2000-2018. More fires are due to natural causes in the eight cities analyzed for the West (upper), while most fires are due to human causes in the eight cities analyzed for the Northeast (lower).

Discussion/Ongoing Work

- Magnitude values do not equally predict coverage: Fires and wildfires display an inverse relationship, while hurricanes demonstrate a positive correlation with magnitude (Table 1).
- Water issues related to fires receive more coverage than hurricanes, though this coverage has been declining over the last several years (Figure 3).
- The differences in fire causes (Figure 4) and the proximity of fires to the wildland urban interface between the regions could influence coverage trends between regions (Table 2).
- Additional analyses are warranted to understand nuances in coverage differences. These analyses include incorporating additional social factors that could influence media coverage and using datasets that capture direct water-related impacts on individuals affected by natural disasters.

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