

**FANNING THE FLAMES:  
HOW U.S. NEWSPAPERS HAVE FRAMED  
TEN HISTORICALLY SIGNIFICANT WILDFIRES  
2003 – 2013**

By

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# **ABSTRACT**

## **FANNING THE FLAMES: HOW U.S. NEWSPAPERS HAVE FRAMED TEN HISTORICALLY SIGNIFICANT WILDFIRES 2003 – 2013**

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This dissertation examines U.S. news coverage of ten historically significant wildfires 2003 – 2013. Using framing theory with support from the Issue Attention Cycle, this historical study examines how wildfire (also referred to as “wildland fire” and “forest fire”) is framed within the nation's print media over time and includes measures of news flow as well as five functions of frames: problem (including actor), attribution of responsibility, moral evaluation, and treatment recommendation. The coding protocol employs five frames: fire danger or threat; loss; conflict; resources, and recovery. Rarely have aspects of this news coverage, such as framing or news flow, been studied even though it crosses areas of high interest in communication, such as, hazard, crisis, risk, and public perception.

From aggregate levels of data, this dissertation establishes that framing the severity of wildfire incidents ranges from a measure in terms of human capital, such as homes, historic structures, and other property, to loss in terms of life, such as firefighting personnel, unaffiliated citizens, wildlife, domestic animals, companion animals, and livestock. Other frames dominating the coverage suggest severity is framed by size, such as acres threatened or lost, the number of personnel involved in fire suppression, or environmental impact, such as air quality threats, water pollution, loss of timber, and conflicts over salvage timber sales. This result aligns with prior research on environmental reporting that suggests environmental news is framed in terms of capital value.

This dissertation also poses a question about journalist source usage in coverage of wildfire; results show journalists rely in equal amounts on agency personnel (federal, state, local, or volunteer jurisdictions) and unaffiliated citizens who are either affected by a wildfire or are expected to be in harm's way. Interestingly, firefighters themselves appeared more often than expected as in other hazard reporting: press comments tend to be restricted to persons in authority (an Incident Commander would be a preferred source in major incidents, such as those selected for this study). Scientists have a high frequency, but rarely in the same article as a fire chief. Industry, such as insurance or timber sources, has minimal appearance despite the 15 months of data collection per incident to allow for discussion of recovery and rebuilding.

Whether space was allotted to discussion of fire prevention (such as the "Firewise Communities" campaign), preparation for emergency situations, and prediction of fireseason as a whole varied by state. Those with lesser population, such as Idaho and Nevada, saw the most coverage of fireseason predictions, preparation for fire conditions, and guidelines for preparing and updating supplies.

Discussion of fire as necessary for biological systems did not appear as part of efforts to provide balanced coverage of wildfire. While this discussion might be appropriate for coverage of recovery, it would not be expected to appear as part of breaking news of a wildfire. Results show this discussion appears when journalists interview biologists, foresters, or silviculturists in discussions of fire exclusion or strategy.

Finally, results show frame and source usage are tied to stages of the news cycle, consistent with prior research. Applying an adapted model of Anthony Downs' Issue Attention Cycle reveals that as the lifecourse of the issue progresses, different sources dominate news coverage but appear at nearly predictably stages of the news cycle.

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*With undying gratitude for my parents,  
Donald Lee Hartman and Marie Terracina Hartman,  
for instilling an intrinsic value of knowledge;  
for Kenneth James Webber, who exemplified  
strength, integrity, and courage;  
for Kae and Spice,  
who kept the flames  
(internal and external) at a distance;  
and to firefighters everywhere:  
“they have our back ...  
we will bump up, bump forward, move ahead,  
and God bless us all.” \**

\* Tom Harbour, director of fire and aviation management, U.S. Forest Service, speaking at memorial service for Engine 57 crew killed on October 26 2006, Esperanza Fire.

## ACKNOWLEDGMENTS

Any historian will admit to a fascination with numbers and dates. I am no different. Therefore, it was essential this study be completed in 2015: the year I moved from “patient” to “warrior.” My first draft? filed the date that honors my return to life. The final version? filed the date of Pa’s 75<sup>th</sup> birthday. Defense? the date breast cancer claimed Mom’s life 12 years earlier. Revision? filed on “Discovery Date.” Accepted the week all of Northern California burned, 2015. One year later, and we couldn’t have done this study for being part of the dataset. Therefore, I must thank the people who have kept me alive, and with drive, to complete this degree and therefore, this project: Dr. Robert Luderer, Deb, Brittany, and Mary, who serve everyone in the Cancer Center at Clarion Hospital. Also thanks to Cara’s Crew, for while you were managing my life, I laid on the sofa, planning this research.

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## **PREFACE**

This study continues the work of historian Stephen J. Pyne whose cultural and historical examination of society's relationship with all elements of fire can only enrich intrinsic knowledge of our planet. Having worked the fire line as Initial Attack and Helitack crew, I respect and fear fire. I also feel intense frustration to read erroneous terms such as "strike force team" "air tender" "water tanker" in news reporting. These terms do not exist. The lack of context also is a concern. My hope is that this study spurs training for hazard reporting similar to programs for crisis and trauma reporting.

Congratulations to the hard-working members of Team Terracina: Kenneth Webber; Donna Webber; Kathy Webber Crafts; Jacob, Jordon, and Ray Crafts; IdeaJones; Patricia Rassmussen; Ilyse Gellar Sternberg; Janice Gray-Butkus; Loriann Stanislawski Wunder; Celia Lamb; Elise Ann Warmbrod; Justin Schultz; Brigitte Arianna Balogh; Ben Trachtenberg; Savana Staggs; Brianna Vlach; Alexandria Zamecnik; Breast Cancer Online (BCO) Support Group; Healing Images (the Art Therapy Program) at Sutter Cancer Center.

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## KEY TO SYMBOLS

- $\chi^2$  = chi square; symbol to indicate a test of association
- $P$  = probability
- Scott's  $\pi$  = measure of probability; used to check coding reliability on studies analyzing content with a coding scheme
- $\alpha$  = Krippendorff's alpha

## INTRODUCTION

Extreme weather events spur a distinct type of news coverage. The temporal news cycle is disrupted as crisis coverage and breaking news dominate headlines, broadcasts, aggregator links, the streaming words of television chyrons. This pattern becomes especially visible when the incident is not one that easily lends itself to prediction, such as an earthquake or a wildfire, but does lend itself to routine public safety campaigns that seek to protect citizens and minimize damage.

With the Issue Attention Cycle (Downs, 1972) and framing as theoretical framework, this study examines how wildfire (also called “wildland fire” or “forest fire”) is framed within the nation’s print media. Seeking dominant frames in media coverage holds significance as readers employ media content as cognitive tools to decipher complex issues, particularly to find relevance to their own lives. Print media sets the agenda for what broadcast and online news outlets cover and it remains a message of persistence: it is what people keep long after days of infamy. It is significant to examine the cycle of news, particularly as coverage would be expected to peak at key points in the event – whether it’s the Initial Attack crews’ arrival, the Incident Commander announcing blaze containment, or the beginning of severe citizen impacts, such as evacuation, their responses (not evacuating or being turned away at shelters), or the preliminary calculation of losses as they return home or insurance adjusters arrive.

This study has as its secondary purpose to examine whether differences exist by location and by type of incident: do readers react differently to reading about fire

risk or a complex fire in Southern California than reading about fire risk or a firestorm in Florida? How about Arizona or Idaho? How does the citizenry respond to reading coverage about wildfire incidents as they occur within or near their communities? Differences in content may exist by location, by readership, and across time in an issue development cycle; an analysis of content may capture these trends. Frames may vary according to type of loss: homes vs. wilderness, rural vs. wildland-urban- interface. How would the content vary in terms of space and journalistic approach? Should it?

Prior research linking framing and the Issue Attention Cycle has focused on tracking an issue such as climate change (Dunlap & McCright, 2008) over time, except for Shih *et al.* (2008), which examined specific frames in a news cycle for several health epidemics and adapted the Issue Attention Cycle model as presented by Downs in 1972. Journalism is event-based, which suggests that applying the Issue Attention Cycle to an issue that comprises many events is worthy of examination. Bennett (2001) acknowledged that media pay most attention to issues as they culminate in crisis, confirming Cappella and Jamieson's 1997 results as they examined salience and selection through framing. Within the literature, framing research has been offered as a theory (Scheufele, 1999), a class of media effects (Price *et al.* 1997), a concept (McQuail, 1994), a paradigm (Entman, 1993), an analytical technique (qualitative and quantitative) as well as a multiparadigmatic research program (D'Angelo, 2002; D'Angelo & Kuypers 2010, p. 2). Despite this fluidity of approaches, Reese' definition of framing as "the way events and issues are organized and made sense of by media, media professionals, and their audiences"

(2001, p. 7) has served to capture much of the justification for continuing to analyze and examine media frames.

Wildfire is one extreme, weather-related event that involves both natural and human causes. News media become an important source of information during such events and, as many scholars argue (Johnson, Bengston, & Fan, 2009), can keep a community rooted in a state of crisis through its news cycle, as mentioned above. The media discourse is key for defining how the public perceives, responds, and relates to wildfire events. Whether public or private property is at risk also is key to themes in media coverage. As prior research notes, environmental journalism often treats the environment as an economic resource (Allan, Adam, & Carter, 2000) or through a worldview accepting of pollution and loss of nature's resources. Paveglio, Norton, & Carroll (2011) note a difference in framing wildfire as to whether private property (residences, resorts) or public lands (national or state forest lands, lookouts, landmarks, historic sites) are threatened. This difference also is noted in reports of and response to firefighting efforts (p. 46).

Paveglio *et al.* (2011) also note the thin literature, despite a growing research focus on similar environmental topics that engage the public with risk and potential hazard, such as climate change. Indeed, much media reporting of wildfire does so in terms of homes threatened, acreage affected, and personnel deployed rather than the immediate and long-term ecosystem impacts, such as air quality, water quality, pollution, food production impacts, groundwater impacts, wildlife threats, mudslide potential, and habitat damage. They suggest further research into media framing of wildfire, hazard reporting, and efforts toward fire suppression (called "fire

exclusion”). Their conclusion raises a question for further study: does media coverage frame fire suppression (fire exclusion) as valued more for personal property than public lands, potentially reflecting a public value that persists over time and across incidents?

As Knight noted (2010), journalists often fail to connect the dots when it comes to humans and the environment. Polluters are not connected to pollution they cause, and by focusing on a crisis event, such as a wildfire, the sociopolitical context never is completely offered. “And research indicates journalists ignore the common fate that humans and wildlife share while focusing on superficial threats (e.g., cars versus deer), rather than the socially sanctioned behaviors that lead to such threats (e.g., urban growth as good for the economy) (Liu, Bonzon-Liu, & Pierce-Guarino, 1997)” (p. 16).

For this dissertation, the query posed by Paveglio *et al.* (2011) developed into a broader query: Is coverage a news-constructed frame or a reflection of public values? Which messages do journalists contribute to the public consciousness in their coverage of wildfire? These are important questions to ask.



## **CHAPTER 1**

This study aims to build an integrated theory of print news coverage with regards to news coverage of wildfire in regional, English-language, U.S. publications, Jan. 1, 2003 – Dec. 31, 2013. This study timeframe covers what state and national records show as three of the largest complex wildfires in the U.S.: the Rim Fire near Yosemite National Park in 2013; Alaska's Taylor Fire, which burned 2.4 million acres summer 2004; and the worst loss of fire personnel in recent history: the Yarnell Hill Fire summer 2013 in Arizona (National Interagency Fire Center, 2014). The research question: In our nation's most recent decade of historically significant wildfire, how is news coverage framing wildfire over the life of an incident?

The coding protocol employs Entman's four functions of frames (define problem and identify actors; make moral evaluation; diagnose causes and identify forces of the problem; offer and justify treatment recommendations, listing likely effects) to analyze frame, source usage, problem definition, moral evaluation, and treatment recommendations (1993). A model of news flow based upon Anthony Downs' Issue Attention Cycle has been adapted to track coverage for each wildfire incident during this timeframe. This model is based upon Craig Trumbo's adaptation (1996) and Shih, Wijaya, & Brossard's (2008) further development of Downs' model.

Key to any historical analysis of frames is to examine all elements that might contribute to the construction of a frame. Per Entman's definition of the problem frame (1993), this dissertation looks at actor, but also in relation to occurrences of each dominant frame. Problem frames in the coding protocol (see Appendix A) are: fire threat or danger; loss; conflict; ecosystem or environment; resources; recovery.

Prior research establishes that source use is about relationships; therefore it is assumed that frames can be associated with sources. As Trumbo (1996) notes, "Sources are used for a wide variety of reasons, including past history with both individual journalists and the media in general, prominence in their field, availability, and their ability to provide useful material" (pp. 270-271). Similarly, Bennett (1990) says, "The media tend to 'index' the range of voices and viewpoints in both news and editorials according to the range of voices and viewpoints expressed in mainstream government debate about a topic" ... This perpetuates a "world in which governments are able to define their own publics and where 'democracy' becomes whatever the governments end up doing" (p.106). Lastly, Rivers and Mathews (1988) offer, "Journalists seldom have the time, the resources, or the expert knowledge to find the full truth themselves. Of necessity, journalists gather information from those who do. Yet, all too often the experts disagree, and journalists use their standard technique: attributing the information or opinion to the sources who provided it. The audience then judges the information by judging the sources" (p. 6).

Source categories contained in the coding protocol (see Appendix A) are: firefighters / law enforcement; citizens; government officials; scientists / researchers; business and industry and trade; and other. Each category contains several subcategories, such as "volunteer, local, state, federal firefighter" and "official of firefighting agency, such as USFS, CalFire; Incident Commander, Fire Captain, Engine Captain" and "government agency (not fire suppression-related) such as BLM, Department of Agriculture, NASA."

## **STATEMENT OF PURPOSE**

In conclusion, this dissertation proposes to build on prior literature examining media frames in news coverage of wildfire by establishing a model of news flow, using an adaptation of the Issue Attention Cycle, to landmark incidents in the United States 2003 — 2013. It further hopes to build on existing framing literature in hazard reporting with an examination of source usage as a submechanism of the Issue Attention Cycle. Insights gathered from the measurement will contribute to establishing whether wildfire, as a hazard or risk for many citizens, is presented in a manner that aligns with trends visible in research examining environmental journalism.

Establishing a picture of how the press has covered environmental issues that include hazard or risk coverage over time can offer a clearer understanding of U.S. environmental thought and action over time.

As prior literature has established, news media not only contribute to but also reflect the building of societal values, which survive over time (Trumbo & O'Keefe, 2001; Ball-Rokeach, Power, Guthrie, & Waring, 1990). How the news media present the environment in a hazard situation will speak to its value in society and whether this role is primarily a capital one, as prior research reveals, or social context is provided that addresses the extent of environmental impacts and the issues society will face.

## **STUDY ORGANIZATION**

Chapter 1 has introduced the study and identified its goals. Chapter 2 offers an overview of the characteristics of wildland fires, fire history, cultural aspects of fire, agency policy and history, key incidents, aspects of firefighting, and fire prevention campaigns.

In Chapter 3, the literature review highlights the theoretical foundations of the study, reviewing recent research findings. This discussion includes an overview of how media reporting on hazard events, whether it's in reference to risk, highlighting what could happen in the upcoming fire season, or hazards, such as breaking news of a fire blazing out of control, has potential to carry greater media effects than other news reporting (Cantril, 1993; Trumbo, 1995) simply for the audience's attendance to the information. Also discussed are trends in source usage and potential effects of such usage.

In Chapter 4, research questions and hypotheses open the chapter. Then the methods to conduct the analysis are detailed. In Chapter 5, the results are presented, and in Chapter 6 the findings are discussed.

Conclusions, acknowledgment of study limitations, and suggestions for additional research close that discussion. References and appendices are located at the end of the document.

## **CHAPTER 2**

Wildfire makes the news. It costs money. It affects people's lives: people who are responsible for managing it are endangered, people who are in its path are endangered, and people who are anywhere in its air current are endangered. Its effects, both beneficial and damaging, are long-lasting. People are displaced. Commerce stops. Traffic stops. Hillsides slide.

The matter of wildfire also is political. Fire is acknowledged within the science community as integral in wildland ecosystems for being necessary to maintain forest health and sustainability. Yet much of the citizenry views wildfire as similar to other hazards in nature: hurricanes, tornadoes, blizzards, and earthquakes. And while each of these hazards presents opportunity to prepare, avoid a level of risk, and assume a certain amount of prevention through community safety campaigns, the citizenry often voices a specific expectation with regard to policy and management of the incident.

In short, as humans encroach more and more upon the wildland-urban-interface, the expectation grows of 100% fire suppression in order to protect their property investments. Thus, fire management grows increasingly complex and political, with those agencies tasked with management decisions suffering micromanagement and questioning at the hands of politicians, bureaucrats, tribal leaders, unaffiliated citizens, and scientists.

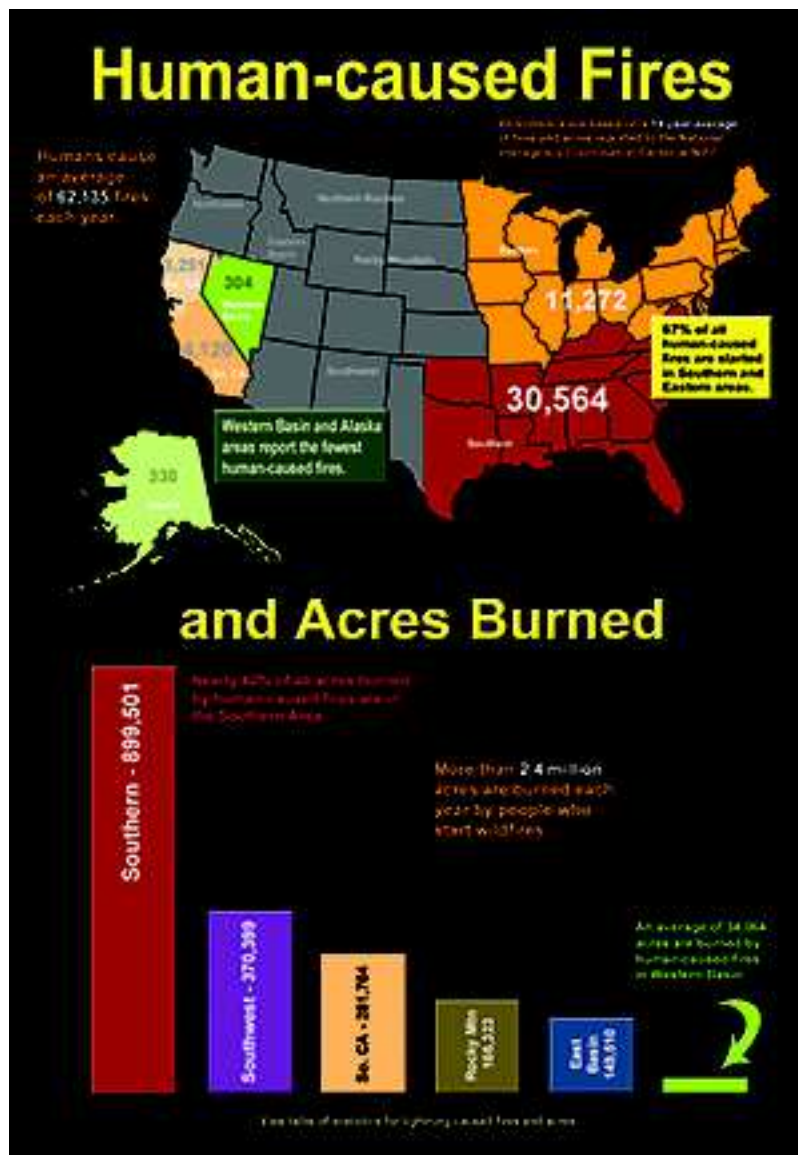
## **BACKGROUND**

The National Interagency Fire Center, based in Boise, Idaho, is a national support center for wildland firefighting. Eight separate agencies and organizations comprise

the NIFC. No one agency takes the lead in jurisdiction; thus, it lacks a single director or manager. The Center was created in 1965 as the Boise Interagency Fire Center amongst several agencies (The U.S. Forest Service, Bureau of Land Management, National Weather Service) that saw a need to consolidate and coordinate fire planning and operations. The National Park Service, Bureau of Indian Affairs, and U.S. Fish and Wildlife Service all joined in the 1970s. In 1993, the name changed to its current one, “to more accurately reflect its national mission” (NIFC, 2014).

Reviewing incident data, it’s important to consider the presence of wildfire in our lives historically and over the past decade (Fig. 1). As Carroll, Cohn, Seeshold, & Higgins (2005) have noted, the causes of wildfire influence a community’s reaction, which often is reflected in public opinion toward firefighters, firefighting agencies, fire prevention, and campaigns. The cause of ignition also can influence discourse in the political arena and dictate the amount and types of aid available to survivors.

**Figure 1 Wildland fire attributed to human causes and acreage loss<sup>1</sup>**

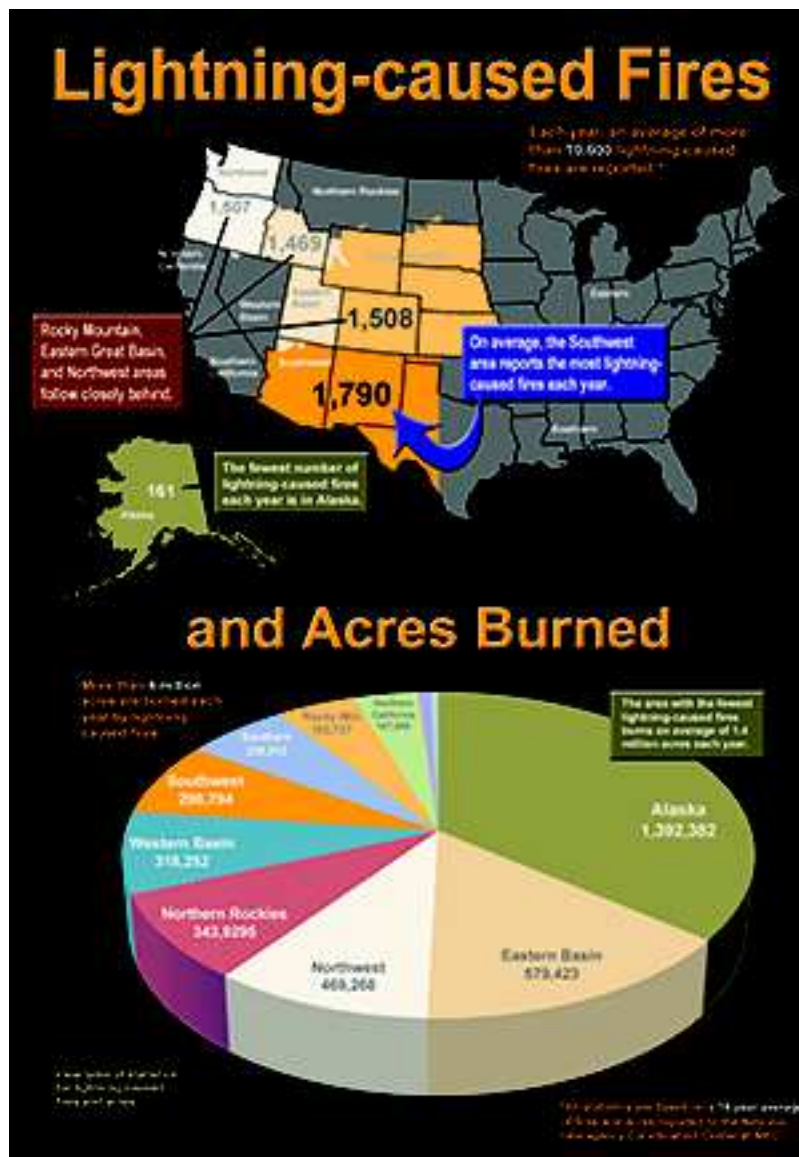


When the cause is nature, lightning and conditions that allow its spark to reach vulnerable timber stands and grasslands, such as high winds and low humidity, are

<sup>1</sup> Data and graphic are courtesy of the National Interagency Fire Center, Boise, Idaho, December 2014.

involved. A review of historical data shows an average 10,600 lightning-caused fires are reported annually (Fig. 2).

**Figure 2 Wildland fire attributed to lightning causes and acreage loss<sup>2</sup>**



<sup>2</sup> Data and graphic are courtesy of the National Interagency Fire Center, Boise, Idaho, December 2014.



To examine media coverage of wildfire occurrences, it is important to review the characteristics of these incidents for this study's time period. As data in Table 1 indicate, wildfire seasons of extreme heat and drought, such as 2006 and 2012, often correlate to a higher number of incidents and a greater cost for suppression efforts.

**Table 1 Wildfire Occurrences and Suppression Cost by Agency 2003 – 2013**

| Year | No. of Fires | Acres – Loss | U.S. Forest Service | DOI Agencies  | Total Cost of Suppression |
|------|--------------|--------------|---------------------|---------------|---------------------------|
| 2003 | 63,629       | 3,960,842    | \$1,023,500,000     | \$303,638,000 | \$1,327,138,000           |
| 2004 | 65,461       | 8,097,880    | \$726,000,000       | \$281,244,000 | \$1,007,244,000           |
| 2005 | 66,753       | 8,689,389    | \$690,000,000       | \$294,054,000 | \$984,054,000             |
| 2006 | 96,385       | 9,873,745    | \$1,501,337,000     | \$424,058,000 | \$1,925,395,000           |
| 2007 | 85,705       | 9,328,045    | \$1,373,919,000     | \$470,491,000 | \$1,844,410,000           |
| 2008 | 78,979       | 5,292,468    | \$1,458,805,000     | \$392,783,000 | \$1,851,588,000           |
| 2009 | 78,792       | 5,921,786    | \$1,018,329,000     | \$218,418,000 | \$1,236,747,000           |
| 2010 | 71,971       | 3,422,724    | \$897,686,000       | \$231,214,000 | \$1,128,900,000           |
| 2011 | 74,126       | 8,711,367    | \$1,414,379,000     | \$318,789,000 | \$1,733,168,000           |
| 2012 | 67,774       | 9,326,238    | \$1,436,614,000     | \$465,832,000 | \$1,902,446,000           |
| 2013 | 47,579       | 4,319,546    | \$1,341,735,000     | \$399,199,000 | \$1,740,934,000           |

<sup>3</sup>Data provided by the National Interagency Coordination Center and the National Fire and Aviation Management Web Applications, March 2015. Not all agencies have filed completed reports for fireseason 2013 as of March 2015.

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<sup>3</sup> The Department of Interior agencies are: Bureau of Indian Affairs, Bureau of Land Management; National Park Service; and U.S. Fish and Wildlife Service.

The U.S. Forest Service is an agency of the U.S. Department of Agriculture. Annual fires and acreage totals include all private, state, and federal lands.

## **WILDFIRE IN HISTORY**

One of the first recorded wildland fires occurred in October 1804 in North Dakota. The incident appears in the records of Lewis and Clark (NIFC, 2014). Acreage is undetermined, but two lives were lost and three injuries were documented. This fire is notable not only for being the first on record, but for additional firefighting significance: “a mother saved her son with a green buffalo skin which acted like a fire shelter” (NIFC Fire Info, 2014). In March 1805, Lewis and Clark recorded another fire, but noted that it was set deliberately; the Native Americans reportedly often ignited fires on the plains each spring to benefit the food sources for the buffalo and horse herds. Historians view this incident as the first prescribed burn on record (NIFC Fire Info, 2014).

But while the last decade has been peppered with extreme and tragic fire events, two historical incidents hold significance for shaping policy, strategy, and agency structure and thus, their significance must be discussed in this history study.

Perhaps the fire that stands out most for being a formative event in shaping firefighting policy and approach is The Great Fire of 1910, which is recorded near Wallace, Idaho. It is believed to be the largest single fire in the recorded history of the United States (Petersen, 1994), responsible for charring 3 million acres in Idaho and Montana and claiming 86 lives (Nelson, 2013). As the Division of Forestry had just become the U.S. Forest Service under its first chief, Gifford Pinchot, five years earlier, the fledgling agency lacked lookouts, fire roads to carry crews and equipment to strategic locations didn’t exist, and firefighters actually reported fighting with “bare hands” (Goodwin Spencer 1994, 1956).

Records show The Great Fire of 1910 required 10,000 firefighters stretching from Western Washington, across the Idaho Panhandle and into Western Montana for suppression before it was contained. “The 1910 fire burned three million acres and killed enough timber to fill a freight train 2,400 miles long. Eighty-six people perished, most burned beyond recognition. ... A ranger put one pathetic sight he had seen into words not easily erased from the imagination. ‘If you could see a little black bear clinging high in a blazing tree and crying like a frightened child, you could perceive on a very small scale what happened to the forest and its creatures’” (Petersen, 1994).

Petersen noted that Gifford Pinchot aimed the public’s anger at the U.S. Congress for failure to authorize funding for training and equipment. With land loss roughly the size of Connecticut and firefighters representing 78 of the 86 fatalities recorded, Pinchot had reason to direct public opinion (Nelson, 2013). He told a reporter at *Everybody’s Magazine*, “For want of trails, the finest forests in the United States were laid waste and scores of lives lost. It is all loss, dead irretrievable loss, due to the pique, the bias, the bullheadedness of a knot of men who have sulked and planted their hulks in the way of appropriations for the protection and improvement of these national forests” (Petersen, 1994).

Historians also note the media coverage also offered tremendous detail in describing the devastation and the survival efforts (Petersen, 1994). An article published in *Everybody’s Magazine* amplified the drama, according to historians: “The poor roasting wretches took many means to preserve from the flames letters, cards, trinkets by which they might be known. Some scraped with the last strength

of their burning hands little holes in the earth, put their papers in them, then flung their shriveled bodies down upon the cache to die..." (Petersen, 1994).

This incident is known for shaping policies at the U.S. Forest Service; immediately afterwards, leaders "vowed to fight all wildfires, even ones that are naturally occurring and of no threat to human life or property" (Nelson, 2013) while biologists who voiced opinions that fire, as a historic and present-day biological process, offered benefits to many levels of many different ecosystems, received little press attention.

While many forest fires, brush fires, wildfires, and urban fires occurred in the decades following, one fireseason that perhaps has riveted the citizenry occurred in 1988: Yellowstone National Park's "Summer of Fire." With intense media coverage following the flames scorching an estimated 1,585,000 acres of this national treasure, the citizenry became involved in policies regarding fire suppression, particularly as national policy leaders maintained their "natural fire" policy for much of the wilderness (e.g., remote and roadless) areas of the park. This incident also remains one of the most studied and the most scrutinized, not only for its fire behavior and the conditions leading up to the wildfire (drought, pine beetle colonies), but also for its distinction as one of the most visible in news media.

The discussion of fire suppression and land policy in Yellowstone National Park, the nation's first national park and earliest national forest, kept it in the public eye. What many didn't know, or recall, is that in 1968 the National Park Service adopted a policy that incorporated nature-caused fire, such as a lightning strike, burning within specified guidelines into its management policy (Christensen *et al.*, 1989).

The continuous media coverage inspired the debate over the “natural fire” policy that perhaps seemed flawed as park boundaries could not contain the flames (which began as 250 separate fires between June and August) and 25,000 people were reported affected — perhaps due to agenda-setting effects of the intensive and extensive media coverage (Franke, 2000). As many firefighters-turned-photographers are known to say, “Flames make great art.” In a study of forest management decisions with regard to firefighting policy and suppression, Fifer and Orr (2013) cite the Yellowstone fires of 1988, commenting, “as these cases illustrate, political concerns continue to create challenges to science-based policy making” (p. 650).

Images of flames beneath banner headlines gracing the nation’s newspapers documented not only the fire’s progress, but also the moves of federal land managers. On television, the Yellowstone fires dominated the rundown for 29 straight days in September as the fire marched toward Old Faithful geyser and two tourist towns northeast of the park (Smith, 1989). While the citizenry, politicians, and editorial writers alike opined that the natural fire policy (renamed a “let burn” policy) was foolhardy, dangerous, wasteful, flawed, and even called for the resignation of park administrator William Mott, a review released December 1988 indicated no missteps or mismanagement occurred during this incident. A moratorium on the policy was instituted, however, to include a policy review that considered economic and social consequences (Hardy-Short and Short, 1995). In an essay analyzing the public debate, the media reporting, and themes of the public discourse, the authors discover two primary metaphors: death and rebirth. Their

essay describes how “the crisis brought two competing views of public lands management to the forefront of public discussion: the *ecological* view that public lands must be managed from a holistic view of resources and the *human-centered* view that resource use should recognize the preeminence of humans in policy-making” (p. 103 emphasis in original).

While wildfire exists as a seasonal hazard for humans, it also represents an aspect of our culture and our biosystem, as historian Stephen J. Pyne reminds us.

*“Fire does biologically what human ceremonies have unfailingly declared it to do: it promotes and it purges. It shakes and bakes. Around its flame revolves an ecological triangle, a circulation of biochemicals, species, and communities. It stirs molecules, organisms, landscapes. It kills plants, breaks down ecological structures, sets molecules adrift, shuffles species, opens up niches, and for a time, rewires the flow of energy and nutrients. Fire upsets, shreds, reorganizes, revives, and quickens” (2001, p. 16).*

Summarizing their findings, Hardy-Short and Short write that this role of fire as a cultural and biological presence as well as a hazard explains the antithetical images present in the discourse surrounding Yellowstone’s fires of 1988: “Much of the debate over the Yellowstone fires reflects humankind’s inherently dichotomous view of fire; while fire destroys and can be as devastating as any natural force, fire can also create, empower, and be managed.” ... “This duality may indicate why forest fire policy and public reaction to fire is so strained. Fifty years of Smokey Bear telling us that only we can prevent forest fires is one of the most deeply embedded messages in American culture” (p. 120 emphasis in original).

## **WHAT SHOULD SMOKEY SAY?**

Generations of Americans have been convinced, thanks to Smokey Bear, that preventing forest fire is their sole responsibility and thus, by association, all fires are bad and must be suppressed. While the breadth of the public relations campaign can be lauded, as Paveglio, Carroll, Absher, & Norton (2009) note, its' message veracity must be examined as well as its' potential for long-term effects: [the campaign] "is an example of successful risk communication – one which contributed to fire exclusion policies and arguably the accumulation of the excess fuels in US forests now threatening wildland-urban-interface homeowners" (p. 81).

Records show that as early as 1902, humans were warned about their actions and the potential of unwanted, human-caused fire, but no formal public information campaign existed. In 1939, a poster blaring the message "Your Forest – Your Fault" appeared, which historians credit to the U.S. Forest Service (Morrison, 1995). This poster featured a forest ranger in the image of Uncle Sam. Between 1936-41, 210,000 forest fires burned more than 30 million acres of timber and rangeland (NIFC, 2014). Viewing timber loss as capital loss, in 1942, the USDA-based Cooperative Forest Fire Prevention Campaign launched. A few years later, the Wartime Ad Council launched a campaign, created by Foote Cone & Belding Agency in 1944 (agency is now known as FCB) aimed at educating the public that all fire was dangerous and detrimental, positioning an iconic cartoon black bear named Smokey Bear to deliver these messages. The "Smokey" name was chosen to honor Assistant Fire Chief "Smokey" Joe Martin (Morrison, 1995). This character remains visible today on National Forest signs indicating daily fire danger as well as in

campgrounds and other public recreation areas with the iconic slogan, “Care will prevent 9 out of 10 forest fires” (Weiser-Alexander, 2014). The second slogan, “Only you can prevent forest fires,” was created in 1947. Artist Albert Staehle created both messages and became in charge of Smokey’s image and all associated artwork (Houser, 2014). A third message showed Smokey, shovel in hand, in front of a burning forest: “This shameful waste WEAKENS AMERICA! – Remember Only *You* Can PREVENT THE MADNESS!”

Early posters of Smokey Bear proclaiming such messages misled the public that Western wildfires tended to be human-caused. As noted in Figure 2 above, today and historically, this is not the case. In Yellowstone National Park, human-caused fires, on average, number 6 to 10 annually, while lightning ignites approximately 35 wildfires (NIFC, 2014). A decade prior to the great fires of 1988, records show not only the pine beetle infestation and several drought seasons, but a decade of fuel loading, which also contributed to the capacity of lightning strikes to ignite decaying leaf piles, down conifers, and dense and diseased timber stands (Donovan & Brown, 2007).

While the early years of the Smokey campaign featured a fictitious character, on May 9, 1950, fire crews in Lincoln National Forest, New Mexico, encountered a bear cub clinging to a scorched conifer during a human-caused blaze called the Capitan Gap. It was a Texas-based crew (conflicting reports on this fact) who expected the cub’s mother to come for him. When she didn’t and the cub was found near the fire line with severe injuries to paws and back legs, the firefighters intervened and



transported the cub, nicknamed “Hotfoot Teddy,” to fire Chief Dave Earl, who arranged for plane transport to a veterinarian in Santa Fe (Morrison, 1995).

Abundant press coverage followed as Chief Earl’s family helped care for the cub (Morrison, 1995). The New Mexico State Game Warden sent an official inquiry to the U.S. Forest Service chief, suggesting he present the bear cub to the agency, “With the understanding that the small bear would be dedicated to a publicity program of fire prevention and conservation” (Houser, 2014). Now with a real-life “Smokey” en route to Washington, D.C.’s National Zoo, a “the” was added to distinguish between the poster and the live bear. All involved agreed there was value in naming the bear cub who survived the Capitan Gap fire “Smokey” after the poster bear as it was a boiled-over pot on the stove that ignited the fire (Houser, 2014).

The Smokey campaign is the longest continuously running ad campaign in the United States (Monroe, Pennisi, McCaffrey, Mileti, 2006). The last poster issue was 1979 (South Carolina Forestry Commission, 2011). The campaign also led to a school program in which children became “rangers” and “Smokey kids.” Children learned about forests, forest products, safety, bears, fire prevention, campfire rules, and took a ranger pledge.

Through it all, Donovan and Brown (2007) say, the campaign fed into early and Eastern forester ideas that fire had no role in forestry management. Citing forestry policy history from Carle (2002), the authors report that the legacy of European school of forestry believed in suppression as being part of “orderly” forestry: fire would destroy young saplings that would grow to maturity. Conversely, fire

management or controlled burning was viewed as “Indian forestry” and damaging to young trees (p. 74).

Despite the policy changes on fire suppression since 1955 and vast community encroachment into wildlands, Smokey the Bear remains a symbol of fire management and suppression (Paveglio, Carroll, Absher, & Norton, 2009). Through focus groups, the authors determined that public opinion supports Smokey as a continuing reminder of personal responsibility for fire prevention actions, such as dousing campfires.

When questioned as to whether Smokey could serve as a reminder of personal responsibility for mitigating risk in the wildland-urban-interface and residential areas, the answer was ‘yes.’ A majority of participants reported the Smokey message could adjust to include responsibility for fire in residential areas. Authors also report participants favoring Smokey promoting fire as a beneficial biological process in the ecosystem.

Researchers in hazard communication have looked to risk and crisis communication research and what is viewed as best practices to see what might be applicable for communication in natural hazard management situations, whether it’s a pre-season message, such as the “firewise campaign” principles printed in news articles or media coverage during a hazard event, such as a wildfire or hurricane requiring evacuation or safety measures related to smoke exposure.

Several principles were offered as a conclusion to several studies (Steelman & McCaffrey, 2013), using focus groups and experiments:

- 1) the communication must be interactive, not a lecture-style town hall meeting with uni-directional communication,
- 2) the communication must be local,
- 3) the content of the communication must be timely, accurate, and useful,
- 4) the communication must come from a credible source, and
- 5) the communication should leverage relationships over time.

The authors conclude that residents of hazard-prone areas are growing increasingly aware of wildfire risks yet may not be aware what they should do to prepare and protect themselves on a local level. This result aligns with prior research (Absher & Kyle, 2008, cited in Paveglio *et al.* 2009, p. 90). Thus, local connections, with known sources, and a recognized icon from a long-established ad campaign might serve the message and the citizenry well (Steelman & McCaffrey, 2013, p. 702).

Reviewing the multitude of hazard communication focus groups results to those that research responses to Smokey the Bear, it is possible that while the initial campaign was misguided in its information and promotion of fire management policy, that Smokey the Bear can be reframed with a more responsible and accurate message — one that acknowledges fire as an essential part of the ecosystem. "Smokey Bear continues to be the most endearing and long lasting symbol of the Forest Service, and participants indicated he can carry new messages of fire inclusion and resident participation in planning for fire management. ... Results

indicate that removal of Smokey would probably be more harmful and less effective than retaining him and changing his message” (Paveglio *et al.* 2009, p. 90).

It is not possible to estimate the number of fires that did not ignite because of humans taking care with a cigarette or a campfire because they were heeding or recalling Smokey’s messages; however, it is curious why humans who live in a fire-hazard area don’t pay heed to similar campaigns for fire safety, such as creating defensible space around a homesite, checking hose viability, updating evacuation kits each year, planning escape routes, and more. Perhaps a new script for Smokey and employing the five principles outlined in Steelman & McCaffrey’s results, noted above (2013), could lead to desired results.

## **CHAPTER 3**

It is worthwhile to consider a history of the environmental movement as this timeline influences how environmental news is presented in mass media. This section briefly reviews which topics might be found in the news, who might be cited as a source, and what would be a dominating frame.

Chief among the topics found in news content are pollution, “extreme hazard,” and natural hazard (Knight, 2010). Hurricane and wildfire season falls under the definition of “natural hazard” and thus, routinely lands in history studies of environmental news reporting. Additionally, this historic timeline traces how humans interact with their environment: a dominant frame of economic resources and capital value (Allan, Adam, & Carter, 2000) in environmental news as well as in hazard reporting, along with the trends in source usage noted in prior research (Smith, 1993; Nelkin, 1995; Lacy & Coulson, 2000), are expected to be consistent over time in a topic of natural hazard reporting, such as wildfire.

### **HUMANS AND THE ENVIRONMENT: A REVIEW**

Many mass media scholars view the environmental movement to have its roots in the late 1960s, shortly after publication of *Silent Spring* by Rachel Carson and the tanker oil spill near Santa Barbara, California (Knight, 2010). But historians trace the environmental movement into a timeline of three stages: 1<sup>st</sup> in the late 19<sup>th</sup> century, second in 1945, gaining steam in 1950, with a rebirth in the late 1960s / early 1970s to what we experience today.

While much history of environmental activism focuses on a few specific individuals such as John Muir (Mosley, 2006) or appears linear in its emphasis on singular issues, such as wilderness preservation (p. 926), DeLuca agreed these histories produce, “a sanitized myth of environmentalism that erases ... the historical conditions of its emergence” (2001, p. 633). Gottlieb (1993) argues for reviewing the entire range of environmental concerns, starting with pollution prevention and land use ethics. In tracing the history of environmental groups 1870 to the present day, McLaughlin & Khawaya (2000) noted no significant declines in growth during World War I or World War II.

Historian Daniel Worster confirms that nature lacks a voice or intrinsic value in history beyond or “outside our own human realm” (1990, p. 1147). Similarly, Allan, Adam, & Carter (2000) say the environment is positioned primarily as an economic resource in news media and reporting is often forced into the event-oriented format, despite not always being a news event (i.e., a crisis); thus sources cited often express views in terms of its capital value and human investment.

Pursuing the theme of early activism and issues on the agenda, Gottlieb argues for recognizing early groups, in the spirit of community issues rather than high-profile individual crusades. This approach includes acknowledging marginalized populations in inner-city locations, fighting for better regulation of indoor pollution, industrial regulations, and a halt to the exploitation of nature (1993). Gottlieb did resist, however, a bi-polar definition of environmental concern as being about either conservation or pollution; rather he said, environmentalism was about, “the core concept of a complex of social movements that first appeared in response to the

urban and industrial changes accelerating with the rapid urbanization, industrialization, and closing of the frontier that launched the Progressive Era in the 1890s” (p. 7).

Aligned with Gottlieb, are Koppes (1988) and Brulle (1996), who define the initial environmental movement in the United States as occurring in the late 19<sup>th</sup> century (p. 127): and McLaughlin and Khawaya (2000). Merchant also documents activism of women in the Progressive Era (1890 to 1913) not only toward conservation but also against inner-city squalor, working conditions, and pollution creation (1996). These women, as she wrote in 1996, illustrated a “growing consciousness of the panacea of bucolic scenery and wilderness, coupled with the need for reform of the squalor of the cities ... burst vividly into the public arena” (p. 100). This activism helped solidify the environmental movement not as one of a few individuals (mostly white males) working to preserve wildness, but as one of a movement of community-based issues, contrary to the tale some historians choose to relate.

As Koppes noted,

*“The problem with the story historians have told us is whom it leaves out and what it fails to explain. Pollution issues are not just a recent concern; people have recognized, thought about, and struggled with these problems for more than a century in significant and varied ways ... And a history that separates resource development and its regulations from the urban and industrial environment disguises a crucial link that connects both pollution and the loss of wilderness” (p. 7).*

When that link is missing from reporting, the overall context from the issue likely is missing from media coverage, thus distancing readers from discussion of the problem-cause-solution (p. 8).

Historians and mass media scholars may debate the timeline of the environmental movement, but this version from this group of scholars states the second stage occurred in 1945, accelerated in 1950, experienced a rebirth in late 1960s / early 1970s into a movement we recognize today (Koppes, 1988; Gottlieb, 1993; Brulle, 1996; McLaughlin & Khawaya, 2000).

As noted earlier, considering the timeline of the environmental movement offers a perspective to environmental topics that make the news, how they are presented over time, and who has a voice. As this brief narrative suggests, environmental news often is forced into an event-oriented, hard-news format that positions the natural world in a crisis or frame of economic value or loss (Allan, Adam, & Carter, 2000; Dispensa & Brulle, 2003).

Natural hazards fall under the list of common topics reported across the decades (Knight, 2010) but similar to other common topics (e.g., pollution, energy sources) often appears without context: the reporting fails to connect the problem-cause reporting to the socio-political conditions that led to the cause and the solution often doesn't make it into the news content (Tuchman, 1978). Reviewing history helps highlight these media practices over time and across news beats.



## **PLAYING WITH FIRE: HUMANS AND FIRE HAZARD**

In 2013, the Secretary of the Department of Interior noted that 40% of new housing starts locate in the wildland-urban-interface [WUI], which is defined as “areas of housing development intermingled with – or adjacent to – vegetated areas” (Radeloff *et al.*, 2005, cited in Alexandre, Mockrin, Stewart, Hammer, and Radeloff, 2015). And although wildfire occurs disproportionately in unpopulated lands each year, “many WUI buildings are lost every year to wildfires, and these losses entail considerable social, economic, and emotional costs” (p. 138).

For forest managers, the challenge becomes a matter of deciding how to budget resources: pleading for restoration work to “boost forest resilience” a 2013 U.S. Forest Service “National Climate Assessment” report noted that the 2012 Waldo Canyon Fire near Colorado Springs, Colorado, would have destroyed more acreage and more homes without local efforts enacting “Fire Adapted” campaign principles ([www.fireadapted.org](http://www.fireadapted.org) confirmed May 2015). “It’s a difficult challenge. When a fire occurs, there’s an expectation, it’s going to be put out,” David Peterson, Forest Service research biologist and study co-author, told the *Denver Post* (Finley 2013). Peterson also pointed out that by thinning forests, “wildfires can at least be tamed” (p. 6A).

The challenge comes, however, in that more resources are dedicated to fire suppression: the Waldo Canyon Fire burned 346 homes in four hours, forced evacuation of 30,000, and charred nearly 19,000 acres, with a suppression cost of \$15.7 million – nearly double the state’s annual fire suppression budget – and that

was just one of several 10,000+ acre wildfires that season (NIFC, 2014). But experts offer good news, too: they say the Waldo Canyon Fire is acknowledged as the first true test of a FireWise campaign: Colorado Springs in 2012 listed 36,485 addresses on 28,000 acres in its WUI area. “Lessons Learned from Waldo Canyon,” a report among the U.S. Forest Service, area fire chiefs, the Insurance Institute for Business and Home Safety, the National Fire Protection Association, and The Nature Conservancy, concluded that \$30,000 spent in fire prevention actually prevented an estimated \$77 million in fire-related loss (Olinger, 2012). A firebreak, constructed with funding from federal grants, is credited with saving at least one neighborhood, called Cedar Heights.

Analyzing the fire risk vs. the actual damage from the Waldo Canyon Fire, Colorado Springs Fire Marshal Brett Lacey told *The Santa Fe New Mexican* newspaper, “about 80 percent of the homes threatened by the fire were saved, in part due to property owners taking the fire risk seriously and preparing ahead” (Matlock, 2013). Unfortunately for some residents on Majestic Drive and Courtney Court, the damage concentrated there, likely due to 65 mph wind patterns and landscaping choices. Between the FireWise, FireSafe, and FireAdapted campaigns and increasing encroachment into the wildland-urban-interface, “federal and local fire managers shift emphasis away from expectations of fire suppression towards communities becoming more fire-adapted” (Alexandre, *et al.* 2015, p. 139).

In 2013, controlled burns remained on hold in Colorado, partly because of a controlled burn that escaped in March 2012 and killed six homeowners. But also, politics comes into play: “People are much more in favor of the mechanical work

[thinning operations]. Support for the prescribed fires is still ‘fairly high,’ but that support goes down if they know the fire is right out their back door,” said Tony Cheng, director of the Colorado Forest Restoration Institute (Olinger, 2012, p. 1A).

Also key to this discussion of human encroachment into wildlands is how development changes the nature of fire suppression – not only the source and amount of available water, but defensible space around a community and fire roads to position crews to isolate the burning area, for example, are altered. These landscape changes, therefore, change the nature of fire hazard, fire risk, and fire suppression strategy. Homeowner associations dictating design standards for roofing materials or height requirements for landscaping and tree canopy also have been found to conflict with recommendations of Firewise and Firesafe councils; some reversed these restrictions in 2012 and 2013, allowing citizens to use non-wood roofing materials and implement leaner tree pruning on their properties. News reports featured these homeowners are becoming “fire ready” (Tullis, 2013). Costs for constructing a defensible space around a homesite, forestry scholars acknowledge, can range from \$3,000 to \$10,000. After a May 25, 2012, directive from U.S. Forest Service Deputy Chief James Hubbard to “suppress all fires unless given special permission” and stop any forest treatment, such as thinning operations, manual release, controlled burns, and brush disposal, experts say, foresters and homeowners alike were sent a message: help will come (Finley, 2013).

Touring neighborhoods and finding homes that, despite surviving the Waldo Canyon Fire, still lacked defensible space, Colorado State University Professor Doug Rideout concluded it was important to, “Understand the behavior. We make the

wildland-urban-interface a more desirable place to live, we're more likely to have a higher property loss in a wildfire. It's a difficult problem for both the homeowners and the federal government" (Olinger, 2012, p. 1A).

Alexandre *et al.* (2015) note a trend of rebuilding after wildfire: In a study of fire-damaged buildings 2000 — 2005, the authors found of 2,318 fires nationwide, 931 involved structures of some sort and 106 involved buildings that burned down. Of 42,724 structures analyzed, their results show 3,604 burned and 1,881 were rebuilt. Surprisingly: "Concomitantly, 2,403 new buildings were built inside fire perimeters within five years of the fire. This means there were more buildings within fire perimeters five years after the fire than before, and by the 5-year post-fire anniversary, the number of new buildings within the fire perimeters was greater than the number of rebuilt buildings" (p. 142).

Fire is heat, fuel, oxygen. Humans can do little to control heat or oxygen, so safety campaigns focus on encouraging the public to reduce the options a fire has for spreading and sustaining itself through a community or a wildland area: fuel. These options include building defensible space around homesites, clearing dead, dying, or diseased vegetation away from property, keeping roofs and gutters free of debris, as well as making wise choices with landscape and construction materials options. Tree thinning, chemical applications to control brush and vegetation, and manual removal of vegetation are some options in wildlands and grasslands.

To estimate the citizenry's perception of fire risk and their efforts – to reduce personal and community fire risk – communication scholars have surveyed communities. Shindler and Brunson noted in 2001 through a national survey on

local knowledge, attitudes, values, and preferences associated with wildfire and fire management a long-standing and complete opposition to fire of any purpose. But to date, no one has attempted a national survey examining influences on the citizenry's opinions.

In 2005, Bowker *et al.* allowed for the possibility that much of public attitude toward fire's role in natural processes stems from "ignorance or through programs perpetuating public fear and misunderstanding of the vital role of fire in wildland ecosystems ... Publicity is often very negative, with homeowners and developers advocating fire suppression to protect their investments. Unfortunately, this leads to fuel build-ups, which eventually are the cause of bigger and more catastrophic fires with devastating consequences" (p. 3).

Shindler and Brunson's results were mirrored in Bowker *et al.*'s 2006 study examining knowledge, attitudes, and preferences toward fire and fire management in rural and wildland-urban-interfaces through the annual National Survey on Recreation and the Environment (see Appendix C). Racial differences emerged with regards to trusting land managers and fire risk: respondents appeared fairly consistent in that African-Americans were more concerned about fire risk than Caucasians or Latinos. Furthermore, 68% of respondents reported assuming personal responsibility for living in fire hazard areas and following guidelines for reducing personal fire risk.

Bowker *et al.*'s study also examined news consumption with respect to fire prevention behavior and found a significant relationship, suggesting residents living in a fire hazard area who had seen, read, or heard about forest fires during the time

of survey administration were more likely to practice defensive behaviors, such as maintaining extra hoses and firefighting equipment, burning undergrowth around a homesite, or otherwise reducing fuel load on the property (p. 28).

## **CHAPTER 4**

For the present study, ten wildfires were chosen for their historical significance in the United States, based upon information collected through the National Interagency Fire Center in Boise, Idaho (Table 2). The selection criteria specified that each incident must be record-setting in its occurrence for its location or for the nation in records maintained at the NIFC.

As wildland fire, or fire in general, is one of the more routine hazards discussed internationally in news media for its significant (current and historical) human, cultural, social, and environmental impacts, presentation of information is critical in terms of offering specific directions, locations, and updates on losses, orders, closures, shelter openings, road conditions, weather conditions, health advisories, airport closures, and more. This presentation also undergoes close scrutiny. Of critical importance is the tracking and presentation of data; the citizenry relies on mass media reports for status updates, but also for “big picture” information that will lead them to safety, today and in the future (Glasser, 2007).

But presentation of information is critical not only for news reporters, but for those involved with policymaking, suppression strategy, evacuation efforts, recovery plans, and recordkeeping. To address and manage the hazards and risk associated with wildfire, sound policy and strategies are needed and evidence is a critical piece of that process (Ekayani, Nurrochmat, & Darusman, 2015). As many players are involved in these processes, ranging from agency managers to insurance companies to politicians, data collection is meticulous (p. 2).

Table 2 lists each wildfire incident appearing in this study: its location, its impacts, its suppression costs, and the historical significance associated with the incident in “Special Notes.” Data, as noted above, is provided courtesy of the National Interagency Fire Center in Boise, Idaho.

**Table 2 Ten Historically Significant Wildfires in U.S. 2003 – 2013**

| <b>Year</b> | <b>Fire</b>            | <b>Acres</b> | <b>Cost</b>             | <b>Physical Structures</b> | <b>Lives Lost</b> | <b>Injured</b>    | <b>Special Notes</b>  |
|-------------|------------------------|--------------|-------------------------|----------------------------|-------------------|-------------------|---|
| <b>2003</b> | CA Cedar / Old Complex | 273,246      | \$17.4 M                | 2,400 structures           | 20                | 1 FF <sup>4</sup> | Largest single fire in CA history.                            |
|             |                        |              |                         |                            |                   |                   |   |
| <b>2004</b> | AK Taylor Complex      | 1,305,592    | \$22 M                  | 0                          | 0                 | 0                 | Record-breaking season: 6.5m acres. Largest US fire on record |
|             |                        |              |                         |                            |                   |                   |   |
| <b>2006</b> | Texas Panhandle        | 250,942      | \$2 M                   | 15 homes, 78 bldgs         | 11                | 7 (5 later died)  | Deadliest wildfire month on record: 200 fires 24 hours.       |
|             |                        |              |                         |                            |                   |                   |   |
| <b>2007</b> | SoCal Complex          | 500,000      | \$75 M (not all report) | 1,500 homes                | 14                | 125 FF, civilians | 16 fires in 1 week; 1 million displaced.                      |
|             |                        |              |                         |                            |                   |                   |   |

<sup>4</sup> “FF” refers to firefighter



Table 2 (cont'd)

|             |                            |         |          |   |    |                   |  |
|-------------|----------------------------|---------|----------|---|----|-------------------|--|
| <b>2007</b> | ID NV<br>Murphy<br>Complex | 653,100 | \$2.6 M  | 0   | 0  | 0                 | One of<br>largest in<br>Idaho's<br>history;<br>16 fires<br>merged  |
|             |                            |         |          |   |    |                   |  |
| <b>2011</b> | AZ NM<br>Wallow            | 538,049 | \$109 M  | more than 75<br>structures                | 0  | 14<br>injured     | Largest<br>single fire<br>ever<br>recorded<br>in the<br>lower 48<br>states                                     |
|             |                            |         |          |   |    |                   |  |
| <b>2012</b> | CO Waldo<br>Canyon         | 18,947+ | \$15.7 M | 346 homes;<br>businesses                  | 3  | 0                 | Worst<br>year for<br>wildfires<br>in state<br>history.   |
|             |                            |         |          |   |    |                   |  |
| <b>2012</b> | OR Long<br>Draw            | 560,627 | \$4.3 M  | rangeland<br>buildings                    | 0  | 0                 | 30K acres<br>burned<br>1 <sup>st</sup> day<br>150-year<br>record:<br>fire<br>spread<br>870 miles<br>in 3 days. |
|             |                            |         |          |   |    |                   |  |
| <b>2013</b> | CA Rim                     | 257,314 | \$127 M  | 11 homes, 3<br>businesses,<br>98 outbldgs | 0  | 10 FF<br>injuries | 13th CA<br>largest in<br>history.<br>Most<br>timber<br>loss since<br>1932                                      |
|             |                            |         |          |   |    |                   |  |
| <b>2013</b> | AZ Yarnell<br>Hill         | 8,000   | \$5.4 M  | 100                                       | 19 | 0                 | Worst<br>single FF<br>loss since<br>9/11. All<br>Hotshot<br>Crew   |

## **LITERATURE REVIEW**

To examine media attention to wildfire incidents, this dissertation draws from several bodies of research. The first involves frame analysis, while a second relates to the flow of news coverage, called the Issue Attention Cycle, as offered by Anthony Downs (1972).

For the present study, the following definitions are employed. Frame analysis is defined as an examination of news content for patterns that, "define the terms of a debate without the audience realizing it is taking place," (Tankard, 2003, p. 97). Dunwoody (1992) defines a media frame as a, "knowledge structure that is activated by some stimulus and is then employed by a journalist throughout story construction" (cited in Trumbo, 1996, p. 271). Tankard *et al.* (2003) define a frame as, "the central organizing idea for news content that supplies a context and suggests what the issue is through the use of selection, emphasis, exclusion and elaboration" (p. 99) while a definition of framing as a process that appears often in research comes from Entman (1993), "the selection of a small number of attributes for inclusion on the media agenda when a particular object is discussed" (p. 52).

In news coverage of events, topics, or issues, some aspects of reality are selected for emphasis while others appear understated or actually ignored altogether. Framing theory offers an avenue to examine these choices as well as consequences of those selections on public perceptions and attitudes.

The opening section of this chapter addresses mass media characteristics, beginning with a general overview of environmental reporting and followed up with a discussion of relevant research findings on media reporting of wildfire incidents.

The second half of the chapter reviews framing theory: describing its history, a review of research applying the four functions of frames (problem definition, two ways to attribute responsibility, moral evaluation), and relevant research studies of framing and environmental issues.

The discussion following explains the Issue Attention Cycle and its application in research examining framing of news reporting over time. The chapter closes with an introduction of research questions and hypotheses.

## **ENVIRONMENT IN THE NEWS**

Reviewing comparative research of media reporting on environmental issues produces an array of findings. Much research aims to examine a specific incident, such as the BP oil spill or Oakland Hills Fire, or a specific issue, such as climate change, for a limited timeframe.

Because news media follow a set criteria of news value for their news reports (Stovall, 2014, p. 127), news content contains an identifiable hard news peg or “newshook,” which often centers around an event. When shuttered into this news format, environmental news contains a frame of hazard and risk, rather than signaling a progression of events or stages leading up to the issue at hand (Neuzil & Kovarik, 1996; Rubin & Sachs, 1973).

As mentioned in Chapter 2, news reporting on environmental issues often fails to connect polluter and pollution – e.g., the societal factors that led to the conditions (Kensicki, 2004). As Downs notes in the third stage of his model (1972), often, society realizes the polluter isn’t entirely a black-and-white matter: a paper factory responsible for extreme air and water pollution into a nearby bay employs thousands and is a key donor for a new hospital. When journalists don’t identify the complexity of environmental issues in their reporting, particularly environmental “events” – which generally don’t occur as breaking news unless it is a hazard event (e.g., Exxon Valdez oil spill, Hurricane Katrina, Rim Fire, Nepal earthquake) – the result, Downs says, is not only citizen apathy but reduced media coverage as discussion over solutions stalls.

Mass media researchers also brand this trend in environmental news a matter of producing contradictory messages for readers: downplaying social and societal factors but dramatizing severe, headline-grabbing events and individual actors. While Bennett wasn't specifically addressing environmental news, this pattern is his chief complaint when he decries news media for "excessive personalization of news" (2001); essentially, framing was his true complaint. He suggested that responsibility was being assigned perhaps inappropriately. Additionally, when it comes to reporting on an abstract or intangible issue, such as climate change or many environmental issues, Hallahan (1999) says an unintended outcome of this trend might be that media consumers can, "Feel absolved of responsibility for social problems because responsibility is so readily attributed to the people portrayed in the news, whether or not the newsmakers depicted are culpable" (p. 221).

But Iyengar and Kinder (2010) suggest audiences become more engaged with "episodic framing," a technique that involves employing people and personalities as chief storytellers of an issue. Conversely, "thematic framing," which offers broad, societal discussions of abstract concepts, instead of case studies or events, appears less frequently in news reports.

Applying traditional news value standards to environmental news reporting can be a flawed approach for societal comprehension of environmental issues (Friedman, 1983 cited in Knight, 2010). And while scholars point out these values should not and may not apply, they do encourage experts, activists, and claimsmakers to "understand and adjust" to these practices "which place newsworthiness criteria above important elements of environmental issues, such as

scientific estimates of risk” (Greenberg, Sandman, Sachsman, & Salomone, 1989 cited in Knight, 2010, p. 65).

Prior research, as noted earlier, establishes that source usage is about relationships; therefore it is assumed that frames can be associated with sources. As Trumbo reports, "Sources are used for a wide variety of reasons, including past history with both individual journalists and the media in general, prominence in their field, availability, and their ability to provide useful material" [1996, pp. 270-271]. Similarly, Bennett says, "The media tend to 'index' the range of voices and viewpoints in both news and editorials according to the range of voices and viewpoints expressed in mainstream government debate about a topic" ... This perpetuates a "world in which governments are able to define their own publics and where 'democracy' becomes whatever the governments end up doing" (1990, p. 106). Lastly, Rivers and Mathews offer, "Journalists seldom have the time, the resources, or the expert knowledge to find the full truth themselves. Of necessity, journalists gather information from those who do. Yet, all too often the experts disagree, and journalists use their standard technique: attributing the information or opinion to the sources who provided it. The audience then judges the information by judging the sources" (1988, p. 6).

Source usage among environmental reporters differs slightly from general assignment reporters (Lacy & Coulson, 2000), from its' very naming as a beat and its' first known reporter assigned to the beat (Palen, 1988; Sachsman, 1976, 1996). Witt found, in 1974, amid a key decade of environmental protection legislation, that environmental activists were cited most frequently in environmental news articles,

followed by governmental sources. But, this trend changed in the 1980s, according to Carmody's results (1995). An environmental backlash that developed in the 1980s and persevered through the mid-1990s saw journalists reaching out to governmental sources first to confirm claims from the environmental community. Thus, the government sources were chiefly allowed to frame the issues (Curtis & Rhodenbaugh, 1999).

Hansen's research confirmed that journalists most often looked to policymakers first in reporting environmental issues (1991), followed by the scientific community, and then legal sources third. While Nelkin's research indicated scientific experts controlled all sourcing in news reporting on the environment, science, and technology (1995), other research shows this changes when the news is not favorable to industry: news of disaster, hazard, and risk tends to show the credibility of government and industry sources fall away (Smith, 1993).

Smith's research examined the Exxon Valdez oil spill; his work concluded that "nonbureaucratic sources have more credibility, and are thus better able to persuade reporters to frame stories according to their nonbureaucratic interpretations of events" (p. 402). Lowe and Morrison add that such incidents, such as the BP oil spill in the Gulf of Mexico April 2012, lead environmental reporters to question the definition of "achievement" as defined by forces now causing environmental devastation rather than progress.

An oft-cited study, Dispensa and Brulle (2003), indicates media's role is to create social construction of environmental issues in media consumers through the selection and citation of sources (p. 83). Knight's study (2010) addresses the

appearance of actors and attribution one step further in examining sourcing trends in environmental reporting: she notes a reliance on government, industry, and scientist sources on the environmental beat, and confirms Kensicki's conclusions (2004) as noted above, that mass media news reports cite sources who point fingers at polluters or problem-causers without noting the social or societal circumstances that led to the problem. This conclusion, she notes, contributes to distance among media consumers reading environmental issues, confirming Kalof's findings (1998): environmental issues become a "dominant form of distant-public discourse – the voice of a scientific and elite culture [as] opposed to concerns at a local-public level" (p. 517).

Alison Anderson concluded that source choices in environmental reporting, as a beat, led to it growing "increasingly politicized" over the years, and becoming increasingly "inter-linked with social, political, and economic concerns" (1997, p. 51). As Moser (2010) noted, humans exist in an environment that can be insulated from environmental conditions on a daily basis, whether it is a work environment with artificial lighting or a home environment with a climate-controlled atmosphere. Thus, she notes, humans spend "relatively little time in attentive, observing, or interactive modes in nature" making it difficult to detect environmental changes (p. 34). Such insulation makes communication about environmental conditions challenging as any "good" or "bad" behavior likely won't produce immediate consequences or results.

In a study of two news magazines' coverage of environmental issues, Terracina-Hartman found that citizens, and business / industry sources dominated news



coverage (2015, In press). The study timeframe was 1976 to 1981, with energy sources, extreme hazards, and food production dominating issues covered. This finding somewhat matched prior literature (Lacy & Coulson, 2000) in that journalists often consulted experts (government, university, and agency scientists), but differed in a focus on gathering citizen voices and covering corporate actions more than legislative activity (p. 233).

Similarly, Trumbo found scientists cited most as sources in his study reviewing content of four elite newspapers covering climate change over a decade (1996). His study also compared source usage and framing with the Issue Attention Cycle (1972); he concluded that as reporting on the issue “grew increasingly politicized” around stage 3 of Downs’ Cycle (p. 269), scientists were used less frequently as sources and politicians more frequently.

## **WILDFIRE AND NEWS MEDIA**

Scholars agree that the majority of media coverage of wildfire and related hazards occurs during incidents and, as such, plays an influential role in how the citizenry is informed and responds to these incidents (Carroll & Cohn, 2007; Pyne, 1997). The literature also indicates more news reporting occurs during times of hazard and immediate risk rather than informing media consumers during longer-term effects or recovery. Steelman & McCaffrey (2013) note that greater media attention to prevention messages pre-fireseason would inculcate media habits for those citizens living in fire-hazard areas and who might need updated information updates during a wildfire incident (p. 684); developing reliable and familiar sources in advance of a natural hazard could aid in safety. Furthermore, the citizenry often expects media to be a communication vehicle to provide ongoing and updated hyper-local risk information.

Criticism is swift and vicious when this role is not fulfilled sufficiently, according to the mass public's expectations (Paveglio, Norton, & Carroll, 2011; Taylor *et al.*, 2007; Glaser, 2007; Toman, Shindler, & Brunson, 2006), leaving some media managers apologetic and vowing better coverage. Other media outlets seek to strengthen ties with fire protection and social service agencies to serve as a clearinghouse for valuable links and maps, such as inciweb (inciweb.nwcg.gov confirmed May 2015), which offers incident-specific updates.

Recent research studying news coverage of “citizen entrepreneurs” – community members who promoted the principles of the fireadapted.org campaign both on an individual level and on a neighborhood-level – concluded that the news

coverage of the campaign's success itself during the Waldo Canyon Fire motivated the citizen entrepreneurs to continue their work and outreach (Koebele, *et al.*, 2015).

For people who are unaffected and consume news coverage of these incidents from afar, the media content perhaps plays a more critical role for opinion gathering and formation: earlier research suggests the news media are a primary source of images in our minds for elements of public affairs that are “out of reach, out of sight, out of mind” (Lippmann, 1922). Salmon (1985) says the effects of mass media can be greater the more distant people are from the experience.

Similarly, prior research applies Herman and Chomsky's Media Propaganda Model (1988) to examine reporting on environmental issues, whether a complex issue like climate change or a natural hazard like wildfire. Results conclude that journalists chose to frame the news emphasizing events and options to stay safe, rather than frame the news highlighting or emphasizing consequences or solutions – in essence, favoring a frame that promotes economic and government stability rather than attribution for the cause and problem, and exploring options for prevention and safeguards.

Good (2008) says this trend sees news content serving as a mouthpiece for the economic and political interests of the elite in reporting on news of environmental hazards (nature and human-caused). Her results align with Kensicki (2004), which described a “media-constructed disconnect” between environmental problems, societal structure leading to problems, and discourse addressing potential solutions.

As Carroll, Cohn, Seeshold, & Higgins indicate (2005), a common result in crisis communication literature reveals two themes when researching community response. These themes correlate to the disaster's origin: a *natural* disaster, such as a hurricane or a flood, tends to bring a community together as the causes of this incident are beyond a community's control. Quarantelli and Dynes call this *social cohesion* (1976). A human-caused or *technological* disaster, such as a hunter's poorly extinguished campfire or a spark from a catalytic converter in dry grasslands, leads to division in an affected community during the incident and after, during recovery and remediation, often degenerating into finger-pointing and blame (Kroll-Smith & Crouch, 1994).

The media framing during this time is critical as media coverage can contribute to broader public opinion and perception of the individual incident, overall response to incidents, as well as how the citizenry gather information to make sense of such incidents (Daniel, Carroll, Moseley, & Raish, 2007). The literature researching mass media as an element contributing to wildfire perception / risk / response and overall public opinion is less thoroughly documented when compared to other types of hazard events, such as hurricanes, floods, or earthquakes. Much recent literature has focused on forestland management policy, such as prescribed burning or fuel reduction, and gathering opinions of citizens living nearby who might be affected by such policy initiatives (Johnson, Bengston, & Fan, 2009).

Bowker *et al.* examined news habits with respect to fire prevention behavior and found a significant relationship, suggesting citizens living in a fire hazard area who had heard about, seen, or read about forest fires during the survey study time

period were more likely to practice defensive behaviors around their properties, such as maintaining extra hoses and firefighting equipment, burning undergrowth around a homesite or otherwise reducing fuel load on a property (2006, p. 28).

Ekayani, Nurrochmat, and Darusman (2015) examined the role mass media plays in wildfire reporting, aiming to analyze source usage of scientists as well as stakeholders' perceptions of this usage. Their overarching goal was to establish the potential of media to influence and set policy agendas in Indonesia. Results of their 10-year, four-newspaper study show scientists account for 14% of all sources in their study sample, thus playing a minor role as quoted sources; however, according to interviewed stakeholders, 88% regard scientists as the most important actors and sources of information for setting policy agendas for forest fire (p. 5).

Additionally, the authors found an incongruency in reference to causes of forest fire: the international media report the causes primarily are "accidental" while the national media report causes of forest fire as "intentional." With this misalignment, the authors argue for an agenda-setting function of media's role, stating, "Evaluating the conformity of causes and solution is important because 'media can establish the nature, sources, and consequences of policy issues in ways that fundamentally change not just the attention paid to those issues, but the different types of policy solutions sought'" (Soroka *et al.*, cited in Ekayani *et al.*, p. 6).

These findings reveal powerful implications for the relationship between news media attention to environmental issues, such as a natural hazard like wildfire, and potential effects on media consumers. While research establishes that media consumers are actively decoding content as they are exposed to news (Gamson &

Modigliani, 1989), news reporting on environmental issues assumes a different role: for much of the citizenry, the news provides the primary source of information (Cantril, 1993; Trumbo, 1995; Kalof, 1997/ 1998). Thus, reviewing the literature conducting historical analysis of news reporting trends can carry particular value for analyzing how the press has covered environmental issues over time and assess its potential effects on the readership.

## **Related Disciplines**

Social science researchers and communication scholars distinguish between communication involving environmental or natural hazard incidents, which involves discussion of risk, and reporting on crisis events: the very nature of the incidents demands different treatment. A hazard incident is defined as having a “season” and therefore, allows for preparation and a level of prevention on the part of communities and municipalities to reduce danger and harm and plan for recovery. Communication is key to that preparation (Steelman & McCaffrey, 2013).

Five key characteristics were identified as critical to effective communication during a wildfire to citizens (Taylor *et al.*, 2007):

- 1) interactive: the public need to be able to ask questions and directions of sources;
- 2) sources need to be local, not faceless and distant;
- 3) information needs to be timely, accurate, and useful;
- 4) information needs to come from sources recognized as credible to the citizenry, and
- 5) information providers should leverage relationships with the citizenry over time.

Taylor *et al.*'s research also confirmed that communication coming from official channels appeared to meet salience criteria of the managers, but failed to meet the needs of the communities affected, specifically up-to-date information and

individual incident and site information. Other research found that community members, particularly where evacuations were extensive, expressed more criticism of agencies and their fire management decisions when communication failed to meet needs and / or expectations (Kumagai *et al.*, 2004).

But researchers also examine communication on natural hazards reporting and management with an eye to crisis communication, seeing the latter is not only studied in greater depth, but also offers elements that can be applied to the former. Therefore, it is worthwhile to sidestep and peruse that literature to discuss some of these elements in greater depth.

Seeger (2006) offered definitions to help distinguish among hazard, risk, and crisis incidents present in the research literature: Natural hazard events refer to wildfire, tsunami, earthquake, flooding; industrial accidents reference events such as explosion, hazard spill, product defect; and intentional incidents include workplace violence, product tampering, terrorist attack (p. 235).

Seeger's results offered best practices for crisis communication, such as establishing sources of communication, delivery modes and methods, and defining types of information in advance (2006), while other researchers, such as Auf der Heide (2004), indicated the communicating itself needed to take great care in describing the community reaction and status: describe resilience and unity where it exists, rather than seeing only devastation and despair. "Researchers have found – at least in the immediate aftermath of disasters – that community resilience and unity, strengthening of social ties, self-help, heightened initiative, altruism, and prosocial behavior more often prevail" (p. 341). In cases of evacuation, the



community may be robbed of its human resources needed for recovery on site, but that does not mean unity does not exist elsewhere. These images must be reported, Auf der Heide reports.

Metaphors matter, write Tierney, Bevc, and Kuligowski (2006). Research into news reporting looks at media effects on the citizenry: how do images of disaster and language of panic, crisis, and risk affect public perception during an incident? (Kasperson, Kasperson, *et al.*, 2005). As noted earlier, reporting on wildfire, for the communities affected, can keep them “rooted in crisis” just for the amount and persistent coverage during the incident (Quarantelli & Dynes, 1977). Then there’s the matter of viewing repeated images of disaster and loss. Furthermore, does reporting on incidents that includes the panic imagery contribute to panic and hinder recovery? Worse, does this panic imagery exist in news reporting as an assumption or a perception communicated by officials or by observers, rather than as a commentary communicated by those involved, such as evacuees or survivors? In other words, an ongoing research question has developed: Has the panic imagery become a stereotype of hazard or crisis event reporting that is not a true representation? These are important questions to ask in examining communication of prevention and safety campaigns as well as news reporting in hazard, risk, and crisis incidents.

Research on reporting of Hurricane Katrina, which hit the Gulf Coast August 2005, shows a break in the media ritual in that broadcast reporters had little interview time with government reporters. In many cases, they were arriving before first responders and talking with survivors, who were expecting supplies, not

to give interviews (Durham, 2009). Durham calls this a de-centered media ritual as reporters often were taped speaking without an official source or with one who failed to offer a solution (p. 95); thus, the narrative became the government's failure and discourse emphasized critique. In other situations of national emergency in which the media ritual remains centered, Durham argues that the narrative is one that fosters unity and consensus and the media align with their official sources in the discourse. "Also known as 'press rites,' 'such stories reflect the stability of the social system by showing it under threat, overcoming threat, or working in a united, consensual way. There is also a general agreement within the press on the way they should be handled and developed'" (Elliott, 1982: pp. 584-5, cited in Durham). For those reporters who stray too far outside the ritual and pose questions that threaten stability, such as reporters questioning President George W. Bush's whereabouts on September 11, 2001, or prohibiting displays of patriotism, the outcry was swift and vicious; the media organization response was loyalty to the public, not to their staff. The journalists lost their jobs (Day, 2005).

Seeger (2006) and Steelman & McCaffrey (2013) align in their research results of crisis and hazard communication best practices in that procedures need to be established before, during, and after an incident, and that communication to media professionals and to the citizenry must rely on well-developed relationships. In short, it must be interactive. Seeger's last step — "be accessible to media" — involves steps of message development, delivery, and preparation; Steelman & McCaffrey focus on identifying credible sources during an incident and establishing community knowledge of fire safety, evacuation procedures, suppression strategies,

and options for new fire strategies. “Results from our study support risk and crisis communication scholarship that indicates providing people with clear and specific information that takes into account local conditions can help minimize the inherent uncertainty of a natural hazard and in so doing help minimize potential dissatisfaction” (Steelman & McCaffrey, p. 702).

Journalism and communication practices develop and have developed around key moments in history, whether the development of the telegraph or the Gulf War; thus, we study historical events of significance for news content to shed light on professional practices. Research on environmental journalism is vast, but hazard reporting research is thin, specifically studies dedicated to wildfire news reporting. Examining where the two fields merge in both news content and research is valuable as the type of incidents that spur such research tend to be historically significant and thus, normative in establishing professional practices.

## **MEDIA FRAMES**

The entire study of mass communications, according to McQuail (1994), is based upon the premise that media exposure causes some level of significant effect. The schools of thought range from direct effects (Lazarsfeld, Berelson, & Gaudet, 1944) to limited effects (Katz & Lazarsfeld, 1955) to cultural effects, to the current approach, which attempts to encompass a combination of approaches, acknowledging it is not necessarily what is done to media consumers, but how they consume media and the context of this usage (Williams, 2003).

The media usually set frames of reference for how a particular issue is perceived. They create a “hook” or “spin” on it, “taking into account their organizational and modality constraints, professional judgments, and certain judgments about the audience” (Neuman, Just, & Crigler, 1992, p. 120).

Most historic analyses of media content will examine the newshook or “frame” of a news product and seek to identify potential salience and media effects for the audiences (Scheufele, 1999). Launched by Goffman (1974), framing takes its roots from sociology. Goffman’s work popularized framing as a metaphor for studying the organization of social information in everyday life. This type of framing involves the “principles of selection, emphasis, and presentation composed of little tacit theories about what exists, what happens, and what matters” (Gitlin, 2003, p. 6).

Kahneman and Tversky applied framing in experimental designs to examine risk judgments and consumer choices in the 1970s and 1980s. The two cognitive psychologists discovered the different ways in which a message is presented or “framed” – apart from the content itself – can lead to very different responses,

depending on terminology used to describe the problem or the visual context provided in the message. They concluded in their Nobel Prize-winning research that, "perception is reference dependent" (Tversky & Kahneman, 1981); participants selected and highlighted some features of reality while omitting others. Surprisingly, participants' decisions were affected even when language was skewed (likely deaths v probable lives saved). Edelman (1993) says framing research indicates the information excluded is as important as the information included.

Nisbet & Hume offer an additional model to complement Downs' ideas (2007) with an emphasis on social construction. Their "model of mediated issue development" introduces framing as a secondary, key mechanism underlying Downs' Issue Attention Cycle. The authors state that once an issue reaches its' peak, it's not as if "the topic achieves celebrity status and dominates the media agenda" (p. 202). Building on the concept of issues competing for attention in a news arena (Hilgartner & Bosk, 1988) competing factors influence content and how news travels through Downs' cycles; news does not happen in a vacuum. They sketch the underlying social mechanisms that drive cycles of media attention, particularly on matters of social issues:

- the type of policy venue where debate takes place or is centred;
- the media lobbying activities of competing strategic actors as they attempt to interpret or frame the issue advantageously;
- the tendency for different types of journalists to depend heavily on shared news values and norms to narrate the policy world;
- the context relative to other competing issues.

Additionally, agenda-setting studies provide a key foundation in framing research. As McCombs and Shaw revised their initial hypothesis “the press doesn’t tell readers what to think, but tells readers what to think about” (1972, p. 177) to offer an additional level of media effects. Their new emphasis – the second level of agenda setting – admitted that the press does more than merely direct readership attention to issues; how it does so affects how the readership views these issues and audience interpretation of news. The authors termed it an agenda of attributes, or framing (McCombs & Ghanem, 2001; McCombs 2004; McCombs, Llamas, Lopez-Escobar & Rey, 1997). “The first level of agenda setting is ... the transmission of object salience. The second level of agenda setting is the transmission of attribute salience” (p. 704).

Scheufele says “accessibility of frames” influences how the citizenry thinks on an issue, using a definition from Hastie and Park (1986) to define “accessible frame” as “the most easily available and retrievable from memory” (p. 116).

As Tuchman (1980) suggested, news content often functions as a window on the world through which people “learn of themselves and others, of their own institutions, leaders, and life styles, and those of other nations and peoples” (p. 1). Just like a window on a house, news content is contained within a frame. In both cases, the frame’s construction itself alters what people are able to see and, ultimately, how they make sense of it. This concept is what is behind “framing.”

Distinct from types of framing present in everyday life, media frames organize the world for both journalists and readers who rely on their reporting, offering “a

set of interpretive packages that give meaning to an issue” (Gamson & Modigliani, 1989, p. 3).

While several conceptual definitions of framing dominate prior literature (Goffman, 1977; Gitlin, 1980; Gamson & Modigliani, 1987; Tankard, 1991; Semetko & Valkenburg, 2000), one receiving substantial attention for its ability to link framing with news media content is Entman’s 1993 definition: “to frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation and/or treatment recommendation” (p. 52).

Also gaining much traction is this definition from Cappella & Jamieson: media framing is “the journalistic tendency to draw attention to certain features of an issue while minimizing attention to others” (1997, p. 47).

The result of this framing process is a product called “frames,” which introduces societal principles to share across social contexts, to share across time spans, and to organize the symbolic world in structured but meaningful ways (Matthes, 2012; Reese, 2007). A well-regarded definition of “frames” comes from Gitlin (1980): “Media frames, largely unspoken and unacknowledged, organize the world both for journalists who report it and, in some important degree, for us who rely on their reports” (p. 7).

With regard to news media content, scholars routinely examine how certain frames persist over others to reflect, and perhaps offer, the citizenry a social construction of reality (Gans, 2004; Gamson & Modigliani, 1989; Tuchman, 1980; Gitlin, 1980).

## **The Issue Attention Cycle**

Applying the Issue Attention Cycle to historical studies of news content suggests an in-depth discussion of the five stages social issues undergo in terms of media coverage, according to Downs' model, is warranted:

- ⇒ pre-problem: a highly undesirable condition exists, but has not captured much public attention;
- ⇒ alarmed discovery: dramatic series of events create public awareness, leading to overconfidence, euphoric enthusiasm in the ability to determine a solution;
- ⇒ realizing the cost: realization of the dangers, but also that the cause is a condition that benefits society also;
- ⇒ decline of interest: involves 3 reactions in varying degrees. Some operate out of boredom, some out of fear, some become discouraged. Attention may shift to another issue;
- ⇒ post-problem: prolonged limbo. A twilight realm of lesser attention or spasmodic recurrence of interest.

Examining media coverage with this model reveals progression in coverage of societal crisis, recovery, debate, and controversy. How an issue attains media attention, unfortunately, is through crisis, such as a wildfire or hurricane, even though such incidents typically occur during predicted or calendar "seasons" and campaigns abound encouraging communities toward "fireswise" and "stormsafes" steps, for example. As many researchers who examine crisis-related news have noted, "Cognizant of the dynamic nature of the news construction process and news



discourse, it is meaningful to look into how frames used to report on these epidemic hazards may evolve over time (Gamson & Modigliani, 1989; McComas & Shanahan, 1999; Nisbet & Hume, 2006). The concept of issue-attention cycle seems appropriate for this analysis” (Shih, Wijaya, & Brossard, 2008, p. 146).

Stages are visible in source usage as the issue transforms from crisis to hazard containment to public policy to cost. The myriad issues (and unknown angles) of any environment-related beat make it hard to predict what is coming as far as coverage, but scholars (Trumbo, 1996; McCright & Shwom, 2010) agree the first three steps are predictable. Once an issue transforms from crisis / recovery into the public demanding change and that change means costs and the journalists begin calling on establishment sources (government officials, agency heads), suddenly the status quo is challenged; an issue becomes politicized. It either drops in and out of sight, similar to immigration reform legislation or climate change – events keep it resurfacing on the public arena (McCright & Shwom, 2010) – or the issue fades to stagnation until it returns to crisis stage and the discourse narrows to the point of the strongest voice is the only voice heard.

But Downs also says not all issues go through this cycle. Three conditions must be met:

- 1) the majority of persons in society are not suffering as much as some minority;
- 2) the suffering is caused by social arrangement that generates significant benefits to a majority or powerful minority of the population;
- 3) the problem has no intrinsically exciting qualities.

To establish a measure for the Issue Attention Cycle, a synthesis of Trumbo’s and

Shih *et al.*'s models is employed, consistent with prior research (Terracina-Hartman & Oshita, 2013). Trumbo's study plots the number of articles for five publications across the study time period, collapsing the bulk of the study sample in the first three stages. Shih *et al.* develop the stages numerically over several years of their study time period, using article number and word count to determine their three stages. The authors compare the difference in amount of news content production between months by using "wax," "wane," "maintenance" to label and identify the results; "other" was used when the amount could not be determined. Brossard *et al.* (2004) examined the Issue Attention Cycle over two cultures in climate change coverage over several years, applying all of Downs' five stages.

As this protocol's time period is 10 years, a combination of these models was employed, based upon Terracina-Hartman and Oshita (2013), which used Stage 1, the pre-problem phase as January 1 of the calendar year prior to the fireseason of the incident; then stage 2 is a "blast" phase, in which the first reporting of the incident occurs, and likely most breaking news articles. This name was added to accommodate coverage of news events in which articles don't publish the first day the event occurs (Terracina-Hartman & Oshita, 2013). The addition of this analysis allows for comparison across media to examine when the problem was reported and how many days after recognition of the problem.

Stage 3 is the period following recognition, according to Downs' definition "realizing the cost" – in which news discourses emphasize plotting the costs of suppression, the insurance payments, and the totality of loss.

Stage 4 is "decline of interest" in which fewer articles are printed, most people

have returned to their homes, and the battles with insurance adjusters begin. Stage 5 is post-problem, in which readers are in limbo: they need information, but it might not be coming in terms of media coverage.

According to prior research and Downs' model as he described it, stages 3, 4, and 5 predict "waning" quantity of news articles. In reporting on a hazard event, whether natural or health-related, subsequent damage could occur, creating mini news events, allowing for waxing time periods (Shih, Wijaya, & Brossard, 2008).

## **Research Questions and Hypotheses**

With some scholars writing that framing research lacks consistency in definition and method (Entman, 1993), but remains a growing field of research (Bryant & Miron, 2004), Capella and Jamieson offered four criteria that a frame must meet in order to be valid (1997, p. 47; 89): it must have identifiable conceptual and linguistic characteristics; it must be observed in common journalistic practices; it must reliably be distinct from other frames; and it must possess representational validity [others are able to recognize it].

Similarly, Tankard (2001, p. 101 cited in de Vreese, 2005, p. 56) offered a list of 11 components in news articles that reliably contain frames:

- \* headlines
- \* subheds
- \* photos
- \* photo cutlines
- \* ledes
- \* source selection
- \* quotes selection
- \* pull quotes
- \* standing logos
- \* infographics (stats and charts)
- \* concluding statements and paragraphs.

While de Vreese advocates precision in operationalizing and measurement for frames (2005), the goal in offering his “typology of frames” is to help organize existing research so to help researchers specify the conditions under which frames emerge and operate in public opinion formation (p. 60). Within his typology, he offers issue-specific frames, which are relevant only, and specifically to, identified events or topics. Others are generic frames, which can surpass topic and theme limitations to be identifiable in relation to different topics, over time, and within different cultures (p. 55).

Similarly, others view the Issue Attention Cycle as too abstract for definition, while others (Trumbo, 1996; Brossard *et al.* 2004; Shih *et al.*, 2008), have adapted the model’s stages to strengthen its application to news coverage of social issues. Therefore, with these and many more studies as foundation, this dissertation offers the following research questions and hypotheses:

**RQ1:** Which frames are present in newspaper coverage of the Top Ten wildfire incidents?

**RQ2:** Which sources are present in newspaper coverage of the Top Ten wildfire incidents?

**RQ3:** How do source usage and frame vary over time with type of incident?

**RQ4:** Which frames associate with which source?

**H1:** Media reports will frame wildfire as severe in terms of capital losses when the wildfire is nature-caused.

**H2:** Media reports will frame wildfire as severe in terms of environment or ecosystem losses when the wildfire is technological- or human-caused.

## **CHAPTER 5**

Historical analysis of content is a method or research technique used for empirically analyzing historical media content through a system of identifying specified characteristics, words, themes. The present study follows Krippendorff's definition of content analysis: "a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use" (2013, p. 24). This technique can be performed qualitatively or quantitatively, using written, oral, and audio forms, including magazine articles, interviews, personal documents, newspaper articles, pamphlets, broadcast scripts, speeches, posters, and more. The technique allows researchers to describe and count various elements in content without the researcher inserting any influence on subjects in the study (Krippendorff, 2013).

Studies that use this technique begin with a focus on content production where "content" is viewed as "the consequence of a variety of other antecedent conditions or processes that may have led to or shaped its construction" (Riffe, Lacy, & Fico, 2005, p. 10). "News article" is defined as content containing references to the wildfire incident, fireseasons, up to the beginning of the calendar year and at least 15 months after first siting.

In environmental journalism, content analysis is a widely used technique to examine reporting of wildlife issues, forest planning, nuclear waste disposal, energy debates, pollution prevention, conservation, and more. Wildfire news reporting studies are few, but researching reactions to and perceptions of wildfire prevention are increasing (Arvai & Mascarennas, 2001).

## **METHOD**

Research Assistant teams began with analysis of historic news texts to describe content and identify the news agenda for environmental reporting, specific to wildfire topics. Additionally, we identified the media agenda and citizen public safety campaigns in news texts appearing as publication of or reference to speech or documents, which are called “antecedent conditions” (Krippendorff, 2013, p. 51; Riffe, Lacy, & Fico, 2005, p. 12). In the present study, antecedent conditions are identified as historical data relating to wildfire conditions, such as suspected cause (where available) and types of loss (life, property, land), prevention efforts, and campaigns.

### **The Time Period**

Chapter 1 identified and discussed fire incidents that shaped agency policy and forestry practices. In the past decade, the planet has experienced extreme weather and extreme fireseasons and some challenging, as well as some successful, recovery seasons. Selection of the 2003 — 2013 study timeframe captures key, historic, and record-setting wildfire incidents during landmark years interspersed with several cooler, wetter-than-normal years. Each incident has received a superlative for its impact within state or national records (maintained at home jurisdictions and at the National Interagency Fire Center) and therefore, is worth examination of its treatment in mass media and for potential trends in reporting this topic.

A challenge of any mass media study examining historical content is to identify

news sources that would likely serve a population connected to the incidents of interest. Viewing newspapers as documents of record and general interest publications (Kellert, 1985), they are a reliable medium of mass circulation for a study that aims to examine news messages the reading public was receiving during a specific time period. It is estimated the regional newspapers would serve as — and were expected to serve as — clearinghouses of information in particular for the hyper-local readership, whether they were in the fire’s path, in an evacuation center, or lucky enough to be out of an area of concern. Data show the reading public maintains media loyalty in terms of choices during historic moments and moments of extreme information needs (Paveglio, Norton, & Carroll, 2011; Taylor *et al.*, 2007; Glaser, 2007; Toman, Shindler, & Brunson, 2006; Neuwirth, Dunwoody, & Griffin, 2000).

This dissertation analyzes print news coverage of wildfire Jan. 1, 2003 – Dec. 31, 2013 in regional U.S. publications (English language). This study timeframe covers what records show as the top record-breaking and record-setting incidents and fireseasons in the United States over the past decade (e.g., the most number of evacuations, the greatest number of personnel lost) as well as several mild seasons with cool, wet summers, according to historic data reported to and maintained at the National Interagency Fire Center. This time span should capture the diversity in experience for readership, both in fire-hazard zones as well as wildland-urban-interface areas.

Articles were located using electronic databases (Lexis-Nexis, News Bank, Gannett Newsstand) using the search terms “wildfire” “forest fire” “brush fire”



“wildland fire” for articles published Jan 1, 2003 – Dec. 31, 2013. An additional collection with search terms for each incident by name (the exception being Colorado June / July 2011, which had several fires simultaneously to produce the record year of loss, and Southern California 2007, in which 16 simultaneous fires comprised the complex; hence all names available were used as search terms) with area and region newspapers published within three years of the incident when possible, beginning six months prior to the relevant fireseasons.

Data collection for the Taylor Fire and Murphy Complex Fire also occurred through individual archive searching as newspaper ownership changed, which affected access within electronic databases to regional publications. Additionally, supplemental searches of area newspaper archives for the Yarnell Hill Fire also occurred, but much of the articles appeared as duplicates, which suggests local copy was published in regional publications due to partnership or ownership arrangements.

Allowing articles printed prior to first reporting of the incident into the collection permits examination of the fire prevention messages: How often does the communication pre-season position wildfire in the news? Key words were required in the discourse for an article to be relevant to the discussion; these included “firesafe” “firewise” or “fireadapted,” which references the prevention campaigns advocating preparation and prevention tips for communities and private property residents. Additionally, post-fire references to the incident needed to be more than a passing mention in reporting a subsequent fire or rescheduling of a golf tournament. Research Assistant teams were directed specifically to eliminate

articles in which a reference to the incident in the study included only rote reprinting of verbatim paragraphs; the article focus needed to be reporting new information about the incident.

This produced a collection of approximately 4,023 articles. Articles were downloaded, duplicates were discarded, as were newswire articles without a byline or that appeared to lack any local contribution or ownership. The goal of this historical analysis of content is to examine reader access among the populations most likely affected; wire-produced copy, from organizations such as Reuters or The Associated Press, that lack a publication name and byline, do not offer sufficient information as to the readership exposed to the content.

The dataset was further filtered to remove postings such as weather reports that appeared more as a column or historic review rather than offering mentions of wildfire risk, status, or updates with respect to forecast or smoke alerts; job notices; and fundraisers that didn't reference updated fire or fire-related information (such as evacuation orders or open shelters). Results from the Editorial, Op-Ed, Column, Commentary, and Letter to the Editor sections of a newspaper were set aside for secondary analysis of the citizenry's agenda in comparison to the media agenda. That analysis includes examination of byline, word count, graphics, and section of publication. With all data filtering completed, this process yielded a dataset  $n = 897$  articles.

Articles were grouped in order of publication date so to assess the cycle of news flow. *USA Today* and *The Christian Science Monitor* remain the sole publications in the sample to offer national perspectives, target a national readership, and for not

being associated with metropolitan locations. International publications were discarded, as the intent is to capture what a community would be most likely to read and be able to contribute to as citizen voices.

As the collection for each specific incident was cleaned, publications outside the immediate region were discarded, as the readership likely would not have access to that content, despite the broad reach of some media conglomerates. The final confirmation on these decisions, however, came from the copyright ownership specifying article publication [example: *Monterey County Herald* articles published on the NC Texas Panhandle fires might interest the South Bay readership and might even have the same ownership as a Texas newspaper chain, but those articles were discarded in favor of articles showing clear copyright to Texas- and Oklahoma-based newspapers. Additionally, a Reuters article that appeared in search results might offer useful information, but if article identifiers are missing as to its publication date, byline, section, and newspaper location, its usefulness in the study is minimal].

Unit of measure is the article with coders examining the lede (first two paragraphs) and headline to verify relevance. “Wildfire” or “forest fire” or “brush fire” or “wildland fire fighting” and the incident name must appear in one of those two locations.

With prior studies as guides, this dissertation uses a combination of Trumbo (1996) and Shih, Wijaya, and Brossard (2008) to establish a measure for the Issue Attention Cycle. Trumbo’s study plots the number of articles for five publications across the study time period, collapsing the bulk of the sample in the first three stages. Shih *et al.* develop the stages numerically over several years of their study

time period, using article quantity and word count to identify the three stages. Brossard *et al.* (2004) examined the Issue Attention Cycle over two cultures in climate change coverage over several years, applying Downs' five stages. As this protocol's time period covers 10 years, a combination of these models is employed – plotting the proportion of articles over the study time period, but primarily calculating the number of articles per incident by stage – adding two additional stages to their models to maintain the five stages Downs originally proposed (Terracina-Hartman & Oshita, 2013). As noted earlier, the data collection begins the calendar year of each individual incident in the study to allow pre-fireseason messages, which matches Downs' stage 1 of the news cycle (1972).

A second measurement selects the highest-ranking newspaper by articles published by state mentioned in the “Top Ten Historically Significant Wildfires” database to build a news flow model, as described above, around coverage of each incident. Arguably, such a measure captures a snapshot of area coverage for the affected citizenry's readership.

## **Coding Categories**

To measure news frames, a protocol with Entman's four functions of frames was employed. Entman's (1993) definition of framing features an emphasis of certain problem definitions, causal attributions, moral evaluations, and treatment recommendations within a communicating text. Entman says the dominant frame is visible in the problem definition and the “causal, evaluative, and treatment interpretations with the highest probability of being noticed” (1993, p. 56). The

present study aligns with Matthes and Köhring (2008) in viewing problem definitions as both issues and actors.

This coding protocol analyzed headline and lede to assess frame or “claim” present in the article, consistent with prior literature. Following Mathes and Köhring (2008), we view the problem definition as including both actors and issues.

For this study, these frames are defined as:

- \* Problem: what is the issue or party identified? As all articles deal with wildfire in some way, several frames will be identified: fire danger or threat; loss; conflict; resource issues; ecosystem; recovery. Key words include: lightning strikes, homes burn, insurance battle, personnel requested, evacuation, returning home, air pollution, water pressure, air tanker requested, supplies for firefighters, traffic jams.
- \* Actor: who are the parties referred to? live quotes or paraphrases (“according to” counts as do references to studies or data sources; a verb indicating speech must be present). Actors will be coded according to a category (firefighter, elected official, federal agency, citizen, industry representative, scientist). Keywords include: firefighter, captain, research, company, and more.
- \* Causal attribution: however the problem issue is identified, causal attribution will be operationalized according to where the blame for the issue is identified and if it is expressed.
- \* Make moral evaluation: as this collection of articles presents action statements – either reporting action taken, action that needs to be taken, action that will be taken, arguing against action, reporting blocked action, or action that appeared unclear – moral evaluation will be

operationalized according to how the causal agents of the problem and their effects are expressed.

- \* Treatment recommendation: this frame is tied closely to the problem definition: whatever the current issue is, treatment recommendation is operationalized as coding categories exploring a specific outcome / call to action and justify treatment of the problem and potential effects, or do not address potential for alternatives and do not discuss.

Data analysis measures for this dissertation adapt measurements for news flow stages from Shih, Wijaya, & Brossard (2008) and McComas & Shanahan (1999) and their approach to categorizing media attention phases. McComas and Shanahan defined a “waxing” stage as a period when news coverage increases, and a “maintenance” stage as a month in which media coverage maintains number of articles. Shih *et al.* added a “waning” phase to indicate when coverage declined from prior time periods.

This dissertation includes a “blast” phase to indicate when peak events spark intense coverage, such as a lightning strike, evacuation, or arrival of inter-agency strike team. “Other” indicates months when cycle stage is not clear.

## CODING PROCEDURES

Each article was coded for descriptive information, such as incident, article identification number, publication name (by state), date, word count, section, byline, and type of news product. Some of this information served as screening information to guarantee each item fit the protocol definition. Section, byline, type of news product, graphic usage, story treatment, and article number analyses are reserved for separate discussion of citizen voice, agenda-setting theory testing, and comparison with citizen media consumption and perceptions of wildfire hazard.

Articles were selected according to incident and the first date of the calendar year prior to its occurrence. As detailed in Chapter 3, articles were included in the collection if the copyright or ownership was a local or region-based publication and available to a reading public near the incident, thus suggesting a level of journalistic salience.

*Problem* was operationalized as explicit mention of issues relating to the individual wildfire. Articles were coded for each of six broad frames:

- fire danger report or siting of fire
- resources
- conflict
- loss
- ecosystem or environment
- recovery

The final coding scheme further broke these frames into 21 themes or subtopics; for example, “environment” covers three categories: “health and medical threats,

such as: smoke exposure, water contamination; threats to community, such as transportation barriers, flooding, mudslide; outages, such as power, water, traffic lights.” The full coding scheme is available in the coding protocol in Appendix A.

*Actor* was operationalized according to the first reference to a cited source. A citation, as described in Chapter 3, mandates a verb of speech accompany the source mention: “according to” “said” “says” or the like. The coding scheme lists five source categories: citizens; firefighting / law enforcement; scientists / researchers; government officials; industry / business / trade representatives; and other.

The coding scheme features several variables for each of these actor categories; specifically: “firefighting / law enforcement: such as fed, state, local, city, rural, volunteer districts; police, sheriff, U.S. marshal, judge, highway patrol, reports; officials of firefighting agencies: fed, state, local, city, rural, volunteer; government agencies; National Interagency Fire Center, USFS (not fire crew); USDA; BLM; reports.”

Research Assistants counted all sources quoted in every item in the collection. If a source had a dual identity, such as a citizen whose family evacuated from a fire zone, but happened to be a member of a fire crew on a different fire (surprisingly common in California), the protocol directed Research Assistants to record the first reference the journalist used to introduce the source.

Causal attribution is operationalized based upon the problem or issue named in the news article and the cause identified or associated with responsibility. Members of the research team who primarily do the marking and recording of article content are called “coders.” In the present study, the coders are explicitly instructed and



trained not to read for causes of the wildfire unless the news content is addressing that issue; rather, the task is to identify the party causing the problem and identify attribution for responsibility and whether the discussion includes who or what should correct it.

Variables are based upon the issues associated with contributing to wildfire conditions and observations during data collection, such as: “land use policy; agency communication; evacuation and rescue operations; lack of personnel or resources; recovery plans; political conflict; other.” The complete description and definition are available in the coding scheme as part of the coding protocol in Appendix A.

Moral evaluation is operationalized to code action statements that express an evaluation of wildfire’s role in the environment: “wildfire is risk and must be suppressed always; wildfire is natural process and can offer biological benefits; they do not say to do anything; they do not talk about the position they hold.”

Treatment recommendation also is operationalized with reference to what should be done to address the issue identified in the problem in step one of the article coding. For example: “They do not talk about how to fix the issue; wildfire is risk and better strategy is needed to suppress every fire; wildfire is nature and it’s better to try to live with it than try to suppress it; we do not know wildfire is risk or not, if they talk about risk, but not talk about the position they hold.”

Lastly, a severity variable was added to examine which terms journalists use to explain the extent of the damage the wildfire has, can, or is expected to cause: land; structures; environment; loss; resources; costs; recovery plans. The variable has several themes for coding; for example, “resources: personnel en route, personnel

deployed, personnel diverted, personnel requested, types of personnel on the fire line.” The intent of this measure is to calculate the frequency of articles published in which wilderness and environmental resources are described as key losses vs. threats to buildings or residents in the wildland-urban-interface and examine differences in source usage, source speech, and discourse, per Quarantelli & Dynes social cohesion measure (1976).

This analysis also will provide a vehicle to measure whether references to the environment are positioned primarily in terms of economic value only or if terms of effects on the ecosystem are included. Inclusion of this variable also aligns with risk communication research that identifies influences of content in media coverage. When media content includes details about the severity of a risk, the citizenry reportedly are more likely to be persuaded to go and gather more information.

Additionally, this type of content has the effect of persuading the citizenry to express a willingness to take safety precautions (Neuwirth, Dunwoody, & Griffin, 2000). Comparing results of this measure with occurrence of “citizen” in the source category may provide insight as to the citizenry’s views on the hazard severity as related to their wildfire risk.

## **CODING PREPARATION**

The coding instrument contains 15 variables, including several that ask for basic identification data, such as article number; date, publication name and state; word count; byline; section; type of news product, and coder ID. Another question asks coders to identify the problem or issue identified in the article and primary actor. Subsequent framing questions involved identifying attribution of responsibility for the identified problem; moral evaluation of wildfire's role in society and associated action statements contained within the news article; counting references to the fire's severity; noting recommendations for treatment, and who might be responsible.

Heeding Nisbet's advice, a coding scheme was developed with two research assistants looking to prior coding protocols from studies examining social and environmental issues coverage in newsmagazines and news articles for guidance (Trumbo, 1996; Bowe et al., 2013; Terracina-Hartman & Oshita, 2013).

The codebook was tested using five news articles of varying lengths randomly selected from a wildfire occurring within the study time period. The Research Assistants marked articles with the appropriate codes, which served to identify areas in the coding protocol that needed additional key words or clarification (e.g., more details on non-fire suppression federal agencies, such as National Weather Service and NASA, and examples of cabinet-level sources, such as Secretary of the Interior). This testing also identified areas in the codebook that needed refining, such as adding "0" as an option in the severity measure and "Other" for Causal

Attribution. Then random articles from that wildfire incident were marked and reviewed until simple agreement of 85 percent was reached. The Research Assistants then marked 112 articles on their own, which was anticipated to represent approximately 10 percent of the study sample, prior to data collection culling. These meetings occurred over approximately four months. The Research Assistants then chose not to continue participating with the present study; recruitment for a second team began.

In all, 10 assistants completed training. This number of coding assistants was needed because several coders could not complete marking of more than one wildfire incident. Exposure to the material in the news articles created a level of discomfort [this is discussed below in Results and again in Limitations] for the coding team and many team members resigned their positions after a brief time on the team as a coding assistant. For that reason, the team of article coders numbered seven in all.

Coding preparation involved two-hour sessions to explain the project and the issues around wildfire and the history of each incident. Each assistant learned about techniques for researching history of mass media content, identifying primary sources, the practice of analyzing content and tools, such as a coding protocol and survey instruments. Then all coders coded the same five wildfire news articles of varying lengths on incidents not included in the present study, but in the same decade. We discussed source identifications, problem definitions, news article types, treatment recommendation, and refined those definitions. The first coder indicated the sources and problem identifications were more specific than the

coding scheme had defined. Other issues included a need for addition of “unidentified spokesperson” actor and “other scientist” actor for generic mentions of “authorities” and “fire scientists.” It was anticipated that these additions could reduce the need for marking “Other” and thus, obviate a high level of recoding results.

Introducing coding assistants to the codebook occurred in the same manner as with the Research Assistant team. Once reaching a simple agreement of 85 percent with either a partner or the study author, on their own, all coders marked 112 news articles, also drawn from a wildfire occurring during the same time period as the present study. Selection of the wildfire for reliability testing was random and occurred out of 72 potential options. The 112 articles represented approximately 10% of a study sample before the last round of database culling. As each coder would code approximately 72 news articles, attaining codebook reliability for 10% is acceptable (Krippendorff, 2013, p. 275). Also, articles for reliability testing were selected in relation to the universe of content study sample used for the present study as a “reliability test should ... reflect the full range of potential coding decisions that must be made in the entire body of material” (Riffe, Lacy, & Fico, 2005, p. 143).

While initial reliability testing anticipated applying a test of *Scott's pi* to correct for chance agreement after each set of 10 articles, because *Scott's pi* is best used for a pair and Fleiss' *kappa* used for a group of three and not for week-to-week examination, a test of Krippendorff's *alpha* was employed for the second team, to accommodate the length of time over which research assistants came and went.

This test is designed to account for the possibility of chance agreement and can adjust for data that is nominal, ordinal, interval, or ratio (Neuendorf, 2002).

Variables deemed reliable, which according to Neuendorf (2002) must achieve .60 and above, based on Krippendorff's *alpha* test are: *theme*  $\alpha=0.81$ ; *problem*  $\alpha=0.81$ ; *causal attribution*  $\alpha=0.685$ ; *treatment recommendation*  $\alpha=0.615$  and *severity*  $\alpha=0.791$ . *Moral evaluation* ( $\alpha=0.568$ ) was not deemed reliable, likely due to its high absence, which is consistent with prior literature that suggests some elements of Entman's framing definition should be coded under different measures (Bowe, Oshita, Terracina-Hartman, & Chao, 2012; Matthes and Köhring, 2008).

Additionally, while the present study follows Matthes and Köhring (2008) in considering problem definitions to include both actors and issues, in the problem one category of actor, "citizens" which is not supposed to be marked [the types of actors are, e.g., "unaffiliated citizen"] contributed to one calculation appearing exceedingly low as compared to other results for that variable. Any calculation in which column 5 is marked leads to a low result, suggesting at least two coding assistants erroneously marked this category at least 12 times before correcting. Thus, a secondary test for the subcategory of problem actor variables are reported as follows: *fire personnel law*  $\alpha=0.896$  *government officials*  $\alpha=0.839$  *citizens*  $\alpha=0.837$  *scientists researchers*  $\alpha=0.834$  *business, other spokespersons*  $\alpha=0.729$ .

## **CHAPTER 6**

### **ANALYSIS PREPARATION**

As outlined in Chapter 4, news content was drawn in a systematic fashion from several electronic databases and from newspaper archive collections May – August 2014. The coding scheme directions for the research team included a verification category on article appropriateness. Article selection was keyed to discourse related to specific incidents within the headline or lede (first two paragraphs) and discussion addressed the incident rather than a passing mention en route to another incident or update. Often entire paragraphs were repeated verbatim as part of round-up articles announcing conditions, status updates, closures, evacuations, or other ongoing information. As the research goal aimed to capture presentation of new information as opposed to repeated and repetitive information and phrasing, such occurrences were to be watched for and deleted from the collection.

This chapter presents results from a historical analysis of environmental news content in which the news product focus is wildfire, forest fire, brush fire, grass fire, and all related topics. Results offered appear in order of research questions and hypotheses. Variables were examined against time and incident to identify patterns offered from theory, prior research, and historical artifacts.

Articles were coded for variables to offer a descriptive perspective to coverage of wildfire in English-language, U.S. state and regional publications. The four functions of frame variables were adapted from Entman (1993).

## RESULTS

After discussing news flow, the first set of results then present data that address questions about framing in news articles about historically significant wildfire. The aggregate data suggest several trends, in particular, when firefighter loss of life occurs, such as 2003 Cedar / Old Fire Complex and the Yarnell Hill Fire: the frame changes to feature fewer and shorter updates on fire status (“fire threat or update”: 5 mentions on Yarnell Hill Fire and 7 on Cedar / Old Fire post-personnel loss) while crews strive for containment as compared to other incidents at this stage. The narrative changes to frame the incident on human impacts, such as profiles on those lost (“loss of personnel”: 34 mentions in Cedar / Old Fire and 41 mentions in Yarnell Hill Fire), interviews with teachers and coaches, and from the community perspective, interviews with those the firefighters died protecting: life in an evacuation shelter (perhaps ‘again’ is a common theme). These results align with Trumbo (1996), and Shih, Wijaya, & Brossard (2008), who found that major events during the lifecourse of an incident changed who had access to news reporters.

Finally, news media often pick up a lead on a forest fire or wildfire based upon the danger or threat level. Often this measurement of severity is protested as it misleads an audience as to what could really be happening (e.g., the Yarnell Hill Fire, the Cedar Fire). Coders analyzed the news texts for the dominant references to severity, finding the “threat to structure” frame, specifically the theme of “houses threatened / houses burned” as often the first and most frequent reference in incidents where the cause was arson. In contrast, the results show “threat to land,”



specifically the “acreage threatened / acreage burned” as the most frequent reference to severity when the fire cause is nature, such as a lightning strike.

Frequency of publication and distribution of coverage per incident are presented in Table 3. Column 4 indicates each incident’s appearance in the results. Column 6 lists publication of first reporting of the incident.

**Table 3 Distribution of News Coverage by Incident and Time Period**

| Year | Fire                | # of Articles published | Publication date in study | Cause of fire                                | First reporting |
|------|---------------------|-------------------------|---------------------------|--|-----------------|
| 2003 | Cedar / Old Complex | 103                     | 2/03 to 8/05              | Arson  | 7/24/03         |
| 2004 | Taylor Complex      | 77                      | 6/04 to 6/06              | Lightning                                    | 6/25/04         |
| 2006 | NC Texas Panhandle  | 38                      | 1/06 to 3/08              | power line                                   | 3/13/06         |
| 2007 | SoCal Complex       | 102                     | 6/07 to 9/09              | power line, truck fire, arson, child + match | 10/22/07        |
| 2007 | Murphy Complex      | 58                      | 2/07 to 3/08              | Lightning                                    | 7/9/07          |
| 2011 | Wallow              | 93                      | 5/11 to 11/13             | campfire                                     | 5/23/11         |
| 2012 | Waldo Canyon        | 227                     | 6/12 to 11/14             | human  | 6/24/12         |
| 2012 | Long Draw           | 78                      | 7/12 to 1/15              | lightning                                    | 7/11/12         |
| 2013 | Rim                 | 80                      | 4/13 to 9/14              | arson  | 8/25/13         |
| 2013 | Yarnell Hill        | 41                      | 7/13 to 6/14              | lightning                                    | 7/1/13          |

During sample analysis, 897 articles published for record-setting wildfires occurring Jan. 1, 2003 – Dec. 31, 2013, were identified. Coders were assigned randomly to two incidents and analyzed the news texts for each incident in chronological order. As noted in Chapter 4, sampling begins at the calendar year start (January 1) of each incident to capture firesafe, firewise, fireadapted.org, or other safety and fire prevention campaign messages.

As noted in Chapter 4, data collection methods included two national publications in addition to the emphasis on regional and local, English-language publications near the recorded locations of the ten incidents: *USA Today* and *Christian Science Monitor*. The intent was to capture a snapshot of which wildfires would make the national news, what the severity frame would be, and with which type of news product. Additionally, incidents in which evacuation affected a large portion of the region could see a significant percentage of the citizenry and thus, the readership in hotels, motels, and shelters, and thus, reading *USA Today* could provide useful information to affected citizens away from their home and usual publications.

The *USA Today* results are as follows: 5 articles on the Rim Fire; 4 on the Wallow Fire; 3 on NC Texas Panhandle fires; 2 on the Murphy Fire; these 14 represent approximately 2% of the entire study's dataset. In regards to framing of wildfire severity, the articles collectively use the following: "threat to land" (9); "threat to structures" (3); "threat to humans" (1); and "threat to environment" (1). The dominant news product was "article with latest news" (6); followed by "update or

folo-up article” (3); then “round-up article” at (2); with “profile interview,” “investigative series,” and “news brief” all at 1 each.

The *Christian Science Monitor* results differ from the *USA Today* results in that the content focuses on two incidents only: the Rim Fire (12) and the Wallow Fire (5). The type of news product is as follows: “article with latest news” (9); “investigative article or series” (3); “news brief” (3); “round-up article” and “folo-up article” at 1 each. This collection of 17 articles represents 2.3% of the study’s complete dataset. The severity frame results similarly do not show much variability: “threat to land” (12); “threat to humans” (3); “loss” (1), and “threat to environment” (1).

What these data suggest in their content choices is a pattern in news value: Report wildfire when the fire is deemed severe, according to the threat level to land (acreage), and the accompanying smoke, air pollution, and water contamination (“threat to humans”). Less of a visible news value was the measure of severity in terms of threat to structures (homes, historic buildings, outbuildings, public structures). This is a small percentage of news content and the audience is vast, as opposed to a local audience, but the difference is interesting to note and would be worthy of further study on a broader scale.

After visually inspecting data, the first step in the analysis, as noted above, was to analyze the news cycle per incident and by publication to develop an integrated theory of news flow. None of these incidents has an inherent relationship with another incident selected for the study other than having a record-breaking status and the routine hazard that weather conditions, geography, and utility companies

present to communities. Thus, this research analysis has potential to identify patterns in discourse and speech.

As the aim of this portion of the present study is to define the news media agenda and examine framing and source usage over time, newswire articles were discarded because of the research team's inability to confirm date and place of publication. This definition proved significant in the sample for at least one incident: the Yarnell Hill Fire June 30, 2013. This fire is in the study for its historic and devastating loss of personnel: 19 members of the Granite Mountain Interagency Hotshot Crew were killed in one hour June 30, 2013. Surprisingly, few articles appeared in search results from *The Arizona Capitol Times* (the state's self-proclaimed publication of record) until the matter involved Governor Jan Brewer and became a matter for various state and federal agency policy discussions.

Similarly, the closest area newspaper, *The Prescott Daily Courier*, was unavailable through electronic databases (although possibly identified as *The Courier*, as noted in copyright notices on various articles). Articles from the closest daily metro newspapers, *The Arizona Daily Star*, offered the most coverage. Thus, this incident's representation in the study sample is 41 articles over 15 months. Had the wire-produced, nonregion-publication articles as well as those announcing fundraiser details, donation drives, candlelight vigils, or memorial plans with little fire information not been culled from the dataset, the sample would have been 234 – the largest of all 10 incidents identified for this analysis.

As is, a scan of nonregional publications suggests sameness of coverage: articles within the dataset also appear in major metro dailies of the U.S., such as *The Chicago*

*Tribune*. Media ownership, as addressed earlier, presents an influence on sample results.

Coders agreed to allow articles published outside of Arizona into the dataset as these articles featured members of the Granite Mountain Interagency Hotshot Crew who had ties to the readership area, such as Cedar City, Utah, and Orange County, California. These articles challenged the definition in the coding scheme, but met regional and copyright requirements.

The Cedar / Old 2003 Complex Fire also saw a personnel loss: Novato, California, firefighter Capt. Steve Rucker died trying to protect a house. His crew's escape route also was cut off. Results for this incident also featured a pattern in which coverage of the blaze itself occupied less space and fewer words than information on Capt. Rucker, his family, and how the investigation was proceeding. The Cedar Fire's Incident Commander and other personnel were under extreme scrutiny for their fire management decisions, which altered the tone and theme of much news coverage: The "Resources" frame with the "Legal Matters" theme appeared 34 times in the third month of the incident, which is the same month as containment. The "recovery" frame with people "returning from evacuation" theme appeared 12 times.

Compare to the 2007 SoCal complex, in which containment was reached and a population of 1 million displaced returned: The "return from evacuation" theme appeared 54 times as part of the recovery frame results. Total articles in the collection for the Cedar / Old Fire number 103 over 21 months.

Given the geography of Southern California and media ownership, many of the same articles print in six or seven newspapers verbatim, which theoretically allows readers a greater chance to read the same information whether they are at home, evacuated nearby, or evacuated far from home. Additionally, with Capt. Rucker's death and hearings at a state agency in Sacramento, a coding team decision allowed newspapers in the Bay Area or from Sacramento's Capital News Bureau into the collection so to analyze these events as part of overall news coverage. The coding team recorded the descriptive data to ensure these articles fit the protocol definitions for copyright and for wildfire relevance.

For the 2007 SoCal Complex, coders anticipated watching for the same pattern in article duplication as the 2003 Cedar / Old Fire Complex, but an alternate trend surfaced: Articles appeared in the results with different headlines and on different publication dates, but nearly verbatim wording (the average was <50 word differences and not necessarily in visible blocks of text). Consider an example to illustrate this point: An article with the headline, "Feds charge man in Old Fire" published August 8 in *The Pasadena Star-News*, while the same article with a headline "Wildfire probe ends in charges" printed August 10 in *The Inland Valley Daily Bulletin* with a word count difference of seven. So, three rounds of data cleaning on this incident were required to safeguard against duplicates in coverage.

The Waldo Canyon Fire may be on track to be one of the most popular case studies in wildfire communication, not only for its communication during the incident (specifically, firefighters' use of social media: Chambers, 2015, unpublished master's thesis), but also pilot testing of fire prevention campaigns that may have

saved some Colorado Springs neighborhoods from burning (McCaffrey & Olsen, 2014) as well as the role of peer leaders in fire prevention and communication (Koebele, Crow, Lawhon, Kroepsch, Schild, & Clifford, 2015). The fact that flames turned and actually entered a large swath of the wildland-urban-interface may explain the level of news coverage: 51 articles in the first five days. While it's customary for a newsroom to publish updates and identify breaking news as such (e.g., "Note to Eds. Breaking 9:06 a.m."; "Note to Eds. Breaking 10:11"), the rule for coders was to include both articles only if the difference in word count was at least 50 and lead paragraphs truly offered updated information (routinely confirmed through "Note to Eds.").

Additionally, a major incident, the Black Forest Fire, occurred just 10 months later that broke all the state records that the Waldo Canyon Fire claimed; thus, while the communities suffer flooding (and loss of life from extreme storms) and are deciding how to manage the burn scar, a second record-breaking fire occurs not too far away.

Clearly, frames of news coverage would change once the cycle of breaking news has passed. The discourse becomes about analysis – extreme fireseasons, prediction, costs of suppression and recovery – and even more analysis of prevention campaigns. Sourcing appears to shift in that scientists and foresters have a voice in explaining fire behavior, fuel loading, and forest health: This source category appears 27 times in the second month of news coverage (the third week of the incident). All total, the Waldo Canyon Fire represents 227 articles in the dataset.

## **The Issue Attention Cycle**

The Issue Attention Cycle (Downs, 1972) model offers five stages to trace the presence of a social issue in media coverage, as detailed in Chapter 3. This dissertation builds on model adaptations from Trumbo (1996), McComas and Shanahan (1999), and Shih, Wijaya, and Brossard (2008).

Table 4 presents the news flow stages, by fire, selecting newspapers with the greatest article publication count. As noted earlier, Stage 1 Pre-Problem tracks wildfire discourse prior to reports of Initial Attack or Helitack crew's arrival(s) at a fire. Stage 2 is the first reporting of the incident (which may not be the date flames are first reported or fire crews are dispatched). Stage 3 is when the assessment of the incident begins, with suppression costs announcement, estimates of loss offered, and recovery plans being formulated. Stage 4 sees a lower interest in the incident, but conflict may appear at this stage, primarily among the agencies, insurance adjusters, and investigative bodies, particularly if a loss is associated with this incident or if questions arose as to the use of fire agency resources. Lastly, Stage 5 sees minimal reporting despite the need for information among the citizenry: The community needs information, resources, and assistance with rebuilding, insurance forms, fundraisers, and more (Downs, 1972).

Examining distribution of the news article sample over time reveals a curve that aligns with the five Issue Attention Cycle stages Downs originally proposed in 1972. These results confirm that this analysis not only is worthwhile to examine as a social issue appearing in the news media, but follows the methods for identifying these



stages noted earlier in prior research: Trumbo (1996), Brossard & McComas (2004), and Shih, Wijaya, and Brossard (2008).

**Table 4 Articles Published in News Cycle, by Incident and Newspaper**

| Newspaper / Wildfire                                    | Pre-Problem | Alarmed Discovery | Realizing the Cost | Decline of Interest | Post-Problem |
|---|-------------|-------------------|--------------------|---------------------|--------------|
| <i>San Bernardino Sun: Cedar/Old</i>                    | 1           | 7                 | 2                  | 4                   | 1            |
| <i>Anchorage Daily News: Taylor</i>                     | 5           | 16                | 9                  | 2                   | 1            |
| <i>The Oregonian: Long Draw</i>                         | 2           | 8                 | 7                  | 3                   | 1            |
| <i>San Jose Mercury News<sup>5</sup>: Rim Fire</i>      | 1           | 1                 | 11                 | 6                   | 2            |
| <i>The Idaho Statesman: Murphy</i>                      | 1           | 2                 | 1                  | 1                   | 1            |
| <i>The Denver Post: Waldo Canyon</i>                    | 0           | 37                | 37                 | 7                   | 13           |
| <i>The Oklahoman: NC Texas Panhandle<sup>6</sup></i>    | 4           | 3                 | 0                  | 0                   | 0            |
| <i>Silver City Sun- News: Wallow</i>                    | 0           | 2                 | 5                  | 2                   | 0            |
| <i>AZ Daily Star: Yarnell Hill</i>                      | 0           | 15                | 3                  | 4                   | 3            |
| <i>Inland Valley Daily Bulletin: SoCal 2007 Complex</i> | 3           | 15                | 11                 | 11                  | 2            |

<sup>5</sup> Media News Group comprises many publications in Central and Southern California. Often the same article appeared verbatim in several publications on the same date; in data cleaning, the protocol was to select the first newspaper that appeared in the dataset. Thus, *San Bernardino Sun* may not have printed more articles than others in the region.

<sup>6</sup> Oklahoma-based newspapers published more articles on the NC Texas Panhandle fires of 2006 than Texas-based newspapers and thus were featured in this analysis of news flow.

As noted in Chapter 4, the search for historical coverage of wildfire began at the calendar year beginning for each incident so to allow for capturing messages about fire prevention, predictions for the impending fireseasons, and other opportunities to measure the public agenda. Of the historically significant incidents selected for the present study, the Murphy Complex Fire saw the most articles published prior to first reporting of the fire, with seven newspapers printing nine articles over five months; seven of nine directly addressed fire prevention options and techniques, such as firewise landscaping. The tenets of agenda-setting theory would support the argument that a public agenda was in place in support of fire prevention campaigns.

To illustrate this result, consider the following article in the Murphy Complex collection: *The Spokesman Review* (Idaho) printed an article, “Class offers tips for fire-safe landscaping” in February 2007, and repeated some of those tips five months later when Lake Tahoe, California, was burning and a local landowner was interviewed for his connection in the readership (“Tahoe fire a wake-up call for Idaho: The Word to the Wise” July 2, 2007).

As data in Table 4 show, publication of articles from this research appears to align with data found in other studies:

- Stage 1: knowledge of potential for the hazard and risk of wildfire coverage is visible in occasional coverage to remind the citizenry to take steps and how to do so;

- Stage 2: wildfire occurs and coverage soars to many articles per day, not only with breaking news updates, but resources to navigate the hazard, such as shelter locations, road closures, emergency information numbers, and supplies for life in a shelter;
- Stage 3: wildfire coverage begins to include discussion of recovery, insurance issues, infrastructure rebuilding, and profiles of people as they attempt to pull their lives back together. Agency conflict can be common in efforts to ensure rebuilding meets current codes and safety standards for the next evacuation. The cost of what happened and what's next is being realized and discussed extensively in media coverage. Blame may appear;
- Stage 4: wildfire coverage may give way to the next hazard: mudslides or floods, possibly made more severe by the burn scar or slopes rendered unstable (burned soil is less absorbent); other issues can arise, such as a realization that recovery isn't only about replacement, sometimes it necessitates improvements, for which there wasn't a plan or a budget pre-fire; thus, some coverage ends up presented without an identifier [e.g., "Wallow Canyon Fires" or "Southern California Fires"] that once appeared prominently on page A1;
- Stage 5: wildfire coverage declines as citizenry interest in the fire as a public issue declines; while many issues abound if there needs to be an

investigation or perhaps state and federal officials are in conflict over wildland management, such as the Wallow Fire, but often, the citizenry is removed from much of this discourse before and during the incident.

Realization sets in that problems aren't easily solved and recovery requires many levels and layers. For example, while articles on hearings about the 2007 Southern California Complex generated about 12 articles in December and prompted discussion about air fleet management and deployment (three months after first reporting of fire), more articles focused on evacuation of 1 million people and 25 who were injured, and what all were finding upon their return.

But these results also fit the model adaptations found in Terracina-Hartman & Oshita (2013), which predicted the breaking news stage (Stage 2) as a "blast" of news coverage (e.g., the most articles printed) and the following, Stage 3, stage "waning" (Shih, Wijaya, & Brossard, 2008) by comparison in the amount of news coverage, with Stage 4, as possibly a "maintenance" stage in which coverage doesn't increase or decrease in amount until Stage 5, which occurs with the least number of articles printed of all five stages.

Perhaps it is the nature of wildfire coverage – or the amount of wildfires that occur – but it was noted in this data collection that a first report could print 3-5 days after Initial Attack crew arrives and the "blast" phase, which is defined as the "breaking news coverage within five days of occurrence" (Terracina-Hartman & Oshita, 2013), occurs when an official source says a wildfire has grown in its threat

level or has evaded containment. In such cases, the news flow meets Downs' original model: an environmental issue does not gain attention until it hits crisis stage (1972).

Conversely, some incidents, such as the Murphy Complex, NC Texas Panhandle, and Yarnell Hill fires, ignited and spread so quickly, reaching hazard level within <24 hours, breaking news was quick, short, and led with updates on wire services, fed by local reporters and press officers at the scene (Chambers, 2015). The collaboration isn't always reflected in bylines or copyright, and thus, publication is hard to discern.

## **Framing and Source Usage**

An analysis of news flow also allows for comparison of sources and frames by stages (RQ3), per Trumbo, who used his sample to collapse his model into three stages (1996). He, like Shih, Wijaya, and Brossard (2008), found that source appearances that changed during the lifecourse of an incident were linked by news cycle phases according to whom was able to get a message into media rather than how journalists chose to present information (1996).

For the present study, the research questions were constructed with the goal to take this prior research one step deeper and examine appearances of the citizen sources category (“unaffiliated citizens” “neighborhood associations” “nonprofit environmental groups”) with frame by type of incident, specifically those linked to arson. Following the research on social cohesion theory of Quarantelli & Dynes (1976), public opinion expressions often rest upon the nature of wildfire, specifically its source of ignition. Prior research shows a community is less likely to unite and work together when the ignition cause is human.

To answer RQ3 and to begin to answer RQ4, which asked which sources appear and during which problem frame, frequencies were run on all problem and source category variables. It must be noted that 192 articles in the sample were published without quoted sources and although “unidentified spokesperson” was an option in the coding protocol, it had frequent occurrences: 23 mentions or 5% in the sample.

With regards to RQ3, data were analyzed according to where the citizen voice occurs; thus, a secondary research question develops: At what stage do citizens claim the most voice and how is the news message framed? With the variables

noted in the coding scheme (see Appendix A) coders could choose among several frames for problem definition: threat, conflict, ecosystem, resources, loss, recovery / planning. Across the three arson-linked incidents noted in Table 3 (Cedar / Old, SoCal 2007 Complex, and Rim fires), the “citizen” category has the most appearances: 77, 28, 50 respectively out of 283 appearances of this source category, accounting for 55% of arson-related articles using this source. The response numbers are as follows across the three incidents: “Citizens:” 85 (29.82%); “nonprofit environmental groups:” 40 (14.04%); “unaffiliated citizen:” 18 (6.32%); “neighborhood associations:” 8 (2.81%); “journalists:” 4 (1.40%). All of these citizen sources appear in Stage 3, Stage 5, or deeper in the sample for each fire (this will be expanded upon below).

Also prominent in results for arson-related wildfires is a “conflict” problem frame (theme options include: “political conflict” “agency conflict” “insurance conflict”), which appears 17, 14, 6 times respectively, to total 37 of 284 articles, or 13% of the dataset. It should be noted that coders commented the conflict problem frame coincided with discussion of “cost of losses / damage” (17 appearances) and “loss of life (farm animals, companion animals)” (four appearances for these incidents). “Legal issues” was designed to capture discussions regarding fire cause investigations, but coders selected “other” for that discussion, anticipating courtroom settings or lawsuit filings; hence, those mentions were recoded as “agency conflict” or “political conflict” when appropriate and “law enforcement” when strictly discussing investigation, arrests, or evidence.<sup>7</sup> Collapsing these types

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<sup>7</sup> The investigation for the Cedar Fire lasted a decade. Its conclusion appears in Rim Fire collection.

of occurrences together accounts for 62 or 22% of the problem frame for these three arson-related incidents.

The threat (“Fire danger or threat” “homes threatened” “acres threatened”) frame appears 69, 25, and 78 times respectively to total 172 references in 284 articles of the arson-related data, or 61% (see Table 2). It is the most commonly occurring frame for these three incidents.

The “citizens” source category (“unaffiliated citizen, neighborhood association, nonprofit environmental group, protestors, or other”) appeared with the “conflict” series of frames or the “threat” frames (“homes threatened” “acreage threatened” “evacuation or rescue issues”) most often in Stage 3 of the news cycle: 16 of 53 mentions, or 30%.

To further break down data, cross-tabs and chi square tests for source and frame in these arson-related incidents found a significant relationship for “conflict” frames and “citizen” appearing in Stage 3 of the news cycle, which, according to the definition is the third phase of news coverage  $\chi^2=23.393$   $df=4$ ,  $P < 0.001$ . Results were not significant for the “threats” series of frames with the “citizen” category of sources in the third phase of the news cycle.

In comparison, three fires with lightning as a confirmed cause – Taylor Complex, Long Draw, and Murphy Complex – were analyzed for citizen source appearances and frame relationships and news cycle. Frequencies were run on all variables.

The Murphy Complex Fire saw the most uses of neighborhood associations as a source in the study sample with seven in 38 articles (19%). Compared to all source usage of 145, this is 5%. This usage occurred Stage 1 of the news cycle (in the



“blast” phase, per Terracina-Hartman & Oshita, 2013) and appears with the “political conflict” theme of the problem conflict frame in 72% of printed articles where this source occurs. “Citizens” and “nonprofit environmental groups” appear 11 times out of 38 articles in the dataset (29%), with the “threat” series the most commonly occurring frame: “fire danger or threat” “health and medical threat” “severe weather” “acreage threatened” (see coding protocol Appendix A).

The Taylor Complex Fire saw 24 “citizen” sources given voice, with the “unaffiliated citizen” at 20 and “nonprofit environmental group” and “neighborhood association” with 2 each. This usage represents 24 of the 75 articles citing sources in this incident (37%) or 17% of sources cited (161). Seventeen of 20 occurrences occurred in Stage 1 (85%) of the news cycle (the “blast” phase), with the remainder occurring in Stage 5 (“decline of interest” per Downs, 1972, definition) and later. The most common frame associated with these appearances is the “threat” series (75%): “health and medical threat:” 3; “fire threat or danger:” 7; “physical threat:” 2; “homes burned:” 1; and “severe weather:” 2. Three associate with evacuation, 2 with evacuation ending, 1 is “other: human carelessness / fuel loading,” and 1 is agency conflict (5% of citizen source mentions).

Analysis of the Long Draw Fire sourcing indicates just four occurrences of the “citizens” category of sources: 1 occurs in the “blast” phase, while 3 others occur in stage 5 (“declining interest,” per Downs, 1972, definition). The framing associated with three of these sources follows the “threat” frame series: “evacuation or rescue issues” and “economic threats to community,” while another is coded as “loss” frame. It should be noted the coding scheme contains an industry category that

includes timber, ranchers, cattle companies, real estate, and others. Sources cited in the Long Draw incident include 20 mentions of “farmers/ranchers,” which shares some “citizens” characteristics. None of these categories, however, is associated with the “conflict” frame. Source usage on this incident totals 149, giving “citizens” and “farmers / ranchers” 16% of total source appearances.

To illustrate this result, consider the following article: The headline reads “Rangeland fire associations prove worth” and it printed about five months after Initial Attack crews arrived. The discussion is on the struggle to get aid, insurance reimbursement, and extensions on repair deadlines. Some sources are quoted as ranchers, but also as members of a range association. Some insurance representatives also suffered great rangeland losses. Results for this category, overall, indicate that citizens had the greatest voice when the reporting frame emphasized capital loss, specifically discussions involving loss of land or animals, which is consistent with results found in Allan, Adam, & Carter (2000).

These data point to source appearances at specific times during the lifecourse of these six wildfire incidents with framing results that reference public sentiment. It does lend support for further investigation of public speech and the subject matter that these sources were referencing, whether it was “loss” or an investigation into fire suppression strategy, which leads to “conflict” or “resources” frames. To truly assess public expression during these incidents, a study would need to include and examine *all* forums in mass media, including submissions to the Letters to the Editor, Commentary, Op-Ed, Ombudsman departments, and others; however, these results do align with prior research, supporting further examination of public

sentiment during hazard events and the likelihood “social cohesion theory” is a factor in a community.

In regards to RQ4, which asked which frames associate with which sources, frequencies and cross tabs were run on all frame results and source appearances. Frames occurrence, in order of most appearance, by category are: threats 65%; resources 18%; conflict 8%; ecosystem 7%; recovery 2%. Source results appear, in order of most appearance, by category of all sources mentioned: firefighting / law enforcement: 70%; citizens: 39%; government officials: 28%; business, trade, industry/other: 26%; scientists, researchers: 15%.

Much research on environmental reporting indicates government sources dominate news coverage (Lacy & Coulson, 2000); however, in regards to this study, the nature of hazard events suggests emergency personnel, in positions of authority or as crewmembers, dominate the coverage, followed by those affected. This somewhat aligns with Nelkin (1985) who found that situations of conflict saw governmental source usage reduced and citizen and scientific source usage increased. Additionally, Trumbo (1996) and Ekayani, Nurrochmat, and Darusman (2015) suggest scientists offer most credibility in environmental hazard reporting and often appear at critical moments of a debate – essentially moments of conflict over policy and during the latter stages of the news cycle.

To illustrate this finding, consider the following articles: “Massive Southeast Oregon wildfires: Did weather, cows, or grazing policies fuel the flames?” which *The Oregonian* published three weeks after containment, on July 25, 2012. Leading the discussion was a debate over Bureau of Land Management grazing policies: Did it

contribute to fuel buildup because of fire suppression or did poor fuel management require fire suppression? A host of scientists (six, each quoted at least three times) weighed in on the topic. The same week, *The Capital Press*, printed an article with the headline, “Fire leaves ranchers with more questions than answers,” which addressed the topic with a look at grazing policies, firefighting policy, and potential drought assistance legislation, also quoting three university scientists to debate the role grazing plays in range management and fuel buildup. Of the five articles in the collection addressing this topic, three were balanced in content (offering both positions within an article), while two went in-depth on the topic, offering research into just one position with bare acknowledgement that another viewpoint existed.

While the conflict frame appears early in coverage (7% of total frames recorded in the “blast” phase for Murphy and Long Draw incidents), the appearance of scientists is not relegated to this frame. Scientists (see Appendix A) are coded for their affiliation 1) government 2) university 3) industry 4) think tanks 5) other. Thus, results do not appear to align with prior research.

Additionally, setting aside the incidents in which a “loss” frame is dominant early on in the incident and the “personnel loss of life” theme dominating the discourse, reveals an interesting source mention: 18% of the firefighter sourcing comes from the Waldo Canyon Fire. As Chambers notes (2015), firefighters were taking to social media to inform citizens and report updates as they were able. The occurrence of a citizen videographer who was taping, narrating, and uploading videos to YouTube with information that not only wasn’t necessarily accurate but rather critical of agency efforts and neighborhood prevention efforts caused upsetness and a little

panic; therefore, extra effort was made to communicate updates and helpful information as the flames spread into the wildland-urban-interface and forced neighborhood evacuations. Some relationships found in this analysis are not surprising given the nature of the topic (wildland firefighting) and the experts for such a topic (firefighters and their respective agencies): therefore, firefighters and the “threat” frame show strong relationships:  $\chi^2 = 24.873$ ,  $df=6$ ,  $P < 0.0001$ .

After identifying the greatest occurrences of sources, cross-tabs were conducted to examine the possibility of significant frame category occurrences for other pairs to answer RQ4. As noted in Chapter 4, many sources occupy more than one identity (e.g., a “pilot” can be a tourism representative or rancher); thus, this analysis uses type of source rather attempting to identify a single, individual identity to cover all possible relationships. Presented below are the strongest co-occurrences between source and frame (please see prior section for discussion of relationships between conflict frame and citizen sources):

- government officials and threats: 33%
- government officials and recovery: 17%
- business / industry with ecosystem: 22%
- business / industry with threats: 35%
- university scientists and threats: 61%

As noted in an earlier discussion of results, source usage results in the present study fail to completely align with prior research; however, it must be noted that most prior research examines one topic in news reporting (e.g., Esperanza Fire) over time

or a specific wildfire as a case study, rather than 10 incidents across a decade. Thus, the diversity in damage, loss, recovery, location, type of incident, and politics among these “Top Ten Historically Significant Wildfires” (Mother Nature Network, 2013; Appendix B) suggests framing the discussion and the sources needed to bring credibility to the news reporting likely could deviate depending upon the audience and the specifics of the wildfire incident.

To further answer RQ1, a severity measure was created to examine how wildfire incidents were framed in terms of loss or potential loss and whether this varied according to type of incident. Prior research indicates environmental reporting frames natural resource loss in terms of capital value (Allan, Adam, & Carter, 2000). This research question sought to examine whether first mention would be homes, acreage, loss of life, or ecosystem and how that frame would vary if the incident were nature-caused or arson-caused. For this calculation, the Yarnell Hill and Waldo Canyon fires were removed after being confirmed as outliers [results didn’t vary beyond “loss of life” (96%) and “homes threatened” (56%) and “evacuation” (42%) respectively].

Results of severity frames occurrences are listed in Table 5 by first appearance, organized by incident, and by number of articles with cause of fire noted. As the data show, the threat to land and loss frames of severity (the natural resource theme) dominate the incidents with lightning as a cause. With regards to arson-related incidents, threat to structures and loss (specifically natural resources theme) dominated the usage.

H1 states, “Media reports will frame wildfire as severe in terms of ecosystem losses when the wildfire is nature-caused,” and H2 states “Media reports will frame wildfire as severe in terms of capital losses when the wildfire is technological- or human-caused.”

The coding scheme dictates that coders mark the first mention in the news article given the possibility that some articles may contain more than one severity reference (e.g., “Thirty thousand acres are burning and 220 families are evacuating”; coders would mark “acreage burned” as a severity frame).

What these data show is “acreage burned” or “acreage threatened” as the most common theme of the severity “threat to land” frames in five of six incidents (60%) where the ignition cause confirmed with a high degree of certainty is either lightning or arson. “Threat to structures” with “homes burned” theme is the most common frame in the Cedar / Old Fire, at 31 mentions (37%).

In the three lightning-related wildfires, the ecosystem / environment severity frame has its strongest occurrence when the theme references loss of natural resources: That loss theme appears 28 times, “loss of wildlife” three times and “threats to environment” eight times; these appearances total 57% for resource-related themes on lightning-related wildfires. Thus, H1 has slight support.

The “threat to structures” frame with themes of “homes burned” “homes threatened” and “plans for recovery” appear 31, 13, 8 times respectively in arson-associated fires or 12% of the dataset. Thus, H2 is not supported.

**Table 5 Frequency of Severity Frame<sup>8</sup> Occurrences in News Articles**

| Severity Frames                        | Taylor Complex (Lightning) | Cedar / Old Fire Complex (Arson) | Murphy Complex (Lightning) | Long Draw (Lightning) | Rim Fire (Arson) | SoCal 2007 (Arson) |
|--|----------------------------|----------------------------------|----------------------------|-----------------------|------------------|--------------------|
| Threat to land: Acreage burned         | 25 (36.7%)                 | 8 (7.50%)                        | 31 (63.3%)                 | 3 (3.9%)              | 68 (86%)         | 56 (55%)           |
| Threat to land: Acreage threatened     | 1 (1.47%)                  | 3 (2.80%)                        | 4 (8.2%)                   | 30 (38.5%)            | 2 (2.6%)         | 1 (1%)             |
| Threat to structures: Homes burned     | 2 (2.99%)                  | 31 (29%)                         | 1 (2.04%)                  | 1 (1.3%)              | 0                | 14 (13.9%)         |
| Threat to structures: Homes threatened | 1 (1.47%)                  | 5 (4.7%)                         | 0                          | 1 (1.3%)              | 4 (5.1%)         | 1 (1%)             |
| Threat to humans: People evacuating    | 8 (11.76%)                 | 9 (8.4%)                         | 4 (8.16%)                  | 4 (7.9%)              | 0                | 13 (12.9%)         |
| Resources: Personnel deployed          | 15 (22.1%)                 | 12 (12.1%)                       | 0                          | 7 (8.97%)             | 0                | 22 (21.8%)         |
| Loss: Natural resources                | 2 (2.94%)                  | 15 (14%)                         | 13 (23%)                   | 13 (16.7%)            | 0                | 13 (21.9%)         |
| Threat to humans: Smoke                | 4 (5.90%)                  | 3 (2.8%)                         | 0                          | 0                     | 0                | 5 (5%)             |
| Threat to Environment:                 | 0                          | 1 (1.47%)                        | 5 (10.2%)                  | 5 (6.43%)             | 3 (3.9%)         | 5 (5%)             |
| Costs: Loss and damage                 | 1 (1.47%)                  | 2 (2.9%)                         | 1 (2.04%)                  | 4 (5.13%)             | 3 (3.8%)         | 2 (2%)             |
| Cost: Fire suppression                 | 1 (1.47%)                  | 2 (2.9%)                         | 4 (8.2%)                   | 11 (14.1%)            | 0                | 3 (3%)             |
| Costs: Plans for recovery              | 0                          | 5 (4.7%)                         | 0                          | 1 (1.3%)              | 0                | 2 (2%)             |
| Loss of life: Wildlife                 | 0                          | 1 (1.47%)                        | 1 (2.04%)                  | 3 (3.85%)             | 0                | 2 (2%)             |
| Loss of life: Animals                  | 0                          | 0                                | 0                          | 5 (6.4%)              | 0                | 0                  |

<sup>8</sup> See coding scheme in coding protocol (Appendix A) for operationalizations of severity themes.



The Causal Attribution variable also is tied to the problem frame. Thus, frequency results of this variable must be examined in relation to the problem frame definition. On the question of “identify the cause of the problem identified in the article,” results are as follows:

- government policy or land use planning: 12%
- funding or resources (equipment, personnel): 23%
- nature (storm, drought, lightning, high winds): 53%
- human (carelessness, accident, arson, illegal campfire): 3%
- firefighting agency communication: 4%
- citizen rescue or evacuation issues: 5%
- other: 2%

This variable can be limiting if the news content does not describe a problem; in hazard news coverage, news might feature a benefit, donations arriving, recovery plans, town hall meetings, or other events that focus on recovery and less on problems. Such content represented 22% of the sample: thus, the “missing” data was recoded into “recovery and associated events.” The categories are not exclusive; for example, agency communication difficulties often tied to severe weather and shifts in firefighting strategy. Consequently, these difficulties could lead to loss of life or loss of property or loss of acreage.

For the incidents with personnel loss of life, chi square tests of independence were run to confirm whether coverage would frame causal attribution as “agency communication” or “funding or resources” or “government policy.” On the Yarnell

Hill Fire, a significant association was found between “agency communication” and “loss of life” problem frame:  $\chi^2 = 11.229, P < .05$  (this is discussed further below). For the Cedar / Old Fire complex, a similar relationship is established, but weaker, showing slight support:  $\chi^2 = 8.490, P < .05$ .

The 2007 Southern California Complex news coverage included 72 mentions of “personnel loss of life” as part of “agency communication” “firefighting resources” or “evacuation issues” in the causal attribution variable. Agency / government officials and elected officials addressed the loss of five firefighters during the 2006 Esperanza Fire. These firefighters died protecting a vacant vacation home. While there’s no evidence that loss influenced any change or adjustment to fire suppression strategy or resource management policy (per later news reports), the discourse and source citations are aligned with three incidents in the sample in which the “loss of life” frame involved firefighters dying on the fire line and elected officials appear earlier in the incident news coverage than those without a personnel loss of life reference.

The Yarnell Hill Fire offered one dominant frame throughout the collection: loss of life. Only four sources categories appear in the collection: firefighters, citizens, government agency, and elected official. The causal attribution variable choice was problematic: Agency communication AND firefighter resources are to blame and both are expressed in each article. Thus, coders noted both for each article, unable to decide which had precedence as details about the Hotshot Crew’s last moments are revealed moment by moment [*note: the investigation is ongoing as this study is completed*].

Moral evaluation, as prior research indicates (Mathes & Köhring, 2008), many times is not present. Such are these results: 55% not present. Given the type of news product mentioned before and the allowance of graphics, news briefs, and extended cutlines accompanying photo essays into the dataset, it is possible that measuring this variable in a different way or operationalizing it with a different method would capture different results (Bowe, Oshita, Terracina-Hartman, & Chao, 2013). Aside from missing data, results are as follows: “wildfire is threat and must be suppressed always” appeared 41% and “wildfire is a natural process and can offer biological benefits” appeared 3%. It is clear from this result that the discussion of fire’s role in society is not always included in news coverage of wildfire. Analysis of the positive mentions indicate it mostly appears in stage 4 of the news cycle and it primarily appeared in the Long Draw and Murphy Complex fires (11%). The geography of both incidents, as noted in Appendix B, features much rangeland and grassland – fuel types that scientists noted in the news content, can benefit from frequent and very hot fire.

Lastly, Treatment Recommendation results also are significant in its absence: around half of the articles have no treatment recommendation (56%). Again, the type of news content collected in the sample may play a role. Such a result also could indicate a need to operationalize it in a different way. But from a review of the problem frame with “fire danger or threat,” dominating, as noted earlier, the discourse first emphasizes breaking news elements and for at least four incidents, does not transition into analysis or policy changes; this is reflected in the coverage.

Thus, balanced reporting of wildfire as a force of nature and not only a hazard, as reflected in this variable's results, does not occur. When present, treatment recommendation appears: 34% "wildfire is risk and better strategy is needed to suppress every fire;" 22% "wildfire is nature and it's better to learn to live with it than suppress every fire;" and 14% "we do not know wildfire is risk or not; if they talk about risk but do not talk about the position they hold."

## **CHAPTER 7**

Any study of historical news content is only as valuable as its primary sources. Selection of sources for this dissertation occurred carefully to capture what news and information the readership would access throughout an incident. Studying the elite press would have less value as capturing local messages, local opinions, and local voices are the goal of this analysis of hazard news coverage. To that end, much erroneous terminology found in hazard reporting might be missed – there’s no such thing as a “strike force team” or “air tender,” which suggests news reporters with regional expertise may have greater access to sources and the Incident Command Center.

The incidents in this dissertation have no inherent connection to each other beyond their historical significance to their location (a state record), or nation (a federal record), as noted in records maintained at a consortium of agencies called the National Interagency Fire Center. As such, this data collection presents an opportunity to reveal trends in framing, source cultivation and expression, and news flow during the lifecourse of wildfire incidents.

## **DISCUSSION**

Expanding and applying modifications to Downs’ Issue Attention Cycle was one goal of this study. When Downs introduced his hypothesis, he considered environmentalism as an issue and pollution as a problem and declared the environmental movement in a spiral decline. He offered three reasons for environmental issues being cyclical, as mentioned above: First, the problem or

suffering is spread unequally, meaning not enough people suffer the problem directly to direct attention to the issue. Second, the problems also generate benefits, likely to a powerful majority of the population. Third, the problems have no “intrinsically interesting” qualities and fail to generate and sustain popular interest.

Scholars have addressed Downs’ theories for decades, particularly the last statement, arguing that the environment itself may not be responsible for the cycle. Shanahan and McComas (1999) argue that elements of communication, particularly how media construct an issue, contribute to societal attendance to an issue. They point out that environmental issues in and among themselves cannot be static, and Downs presents his three characteristics (mentioned above) as “facts that will inalterably and immutably contextualize the development of public awareness of environmental issues.” ...“We argue that social and narrative factors distinct from the environmental issue itself influence the attention cycle” (p. 151).

As McCaffrey and Olsen (2014) and Chambers (2015) noted, the sources most trusted in wildfire information tend to be agencies, particularly the National Park Service and even Smokey the Bear. McCaffrey and Olsen’s research and results are site-specific, but they did note that the National Park Service dominated, even when the closest national park-owned land was more than 50 miles away. Also, their results didn’t unpack the response of Smokey the Bear: is it the icon on literature? is it a sign on reminders of announcements or fire prevention campaigns? or is it the physical presence of a person in a Smokey suit at one of these community meetings that rated so high among participants? The data from that study will offer results for scholars to analyze for many studies, but important follow-up questions persist.

So where does mass media fit in? As Glaser (2007) and other media analysts noted, there is a need for a hazard schedule and perhaps training, not only in terminology, but also in interviewing and data presentation. Reviewing the results of the news cycle in light of the article publication schedule suggests agenda-setting is in effect: The Murphy Complex incident saw the most pre-fire articles about firewise and firesafe tips (14% of its sample), and printed the most articles analyzing fire prevention on a policy level 5-6 months after the incident (13%), yet this incident published the second-to-least number of articles of the entire collection (56).

The Waldo Canyon Fire also suggests evidence of agenda-setting for the sheer number of articles printed in the first five days across many publications, as noted in Chapter 2 (30 articles in 7 publications: 13% of its collection). Article production slows slightly four months later, but floods near the burn scar keep the topic in the public mind in Stage 4 of the news cycle. When the Black Forest Fire occupies the flames stage nearly a year later, the discourse adjusts not only to comparing the record-breaking statistics between the two, but also discussions of the fireadapted.org pilot campaign that may have saved a Colorado Springs neighborhood and how those practices could be applied to other locations. Mudslides and flooding on burn scars are not unusual concerns; scorched soil is less absorbent.

Of all 10 incidents, only the Waldo Canyon and Wallow fires show evidence of agenda-setting for this discussion just three months after first reports of a fire. Coverage of mudslides in each incident number 8 and 5 respectively, or 2% of each

incident's collection. It should be noted that results of the data search produced news articles reporting incidents that cause ancillary damage, such as mudslides and flooding, but many such articles get dropped for not sufficiently addressing the fire itself other than geographically (e.g., locating mudslide areas along a burn scar) and thus, not meeting the protocol definition.

Other such trends occurred with other incidents in the sample, such as the 2003 Cedar / Old Fire. One neighborhood, Cedar Glen, proved difficult to reach and even tougher to evacuate due to its road structure. When residents tried to return, issues arose with infrastructure rebuilding and renovation; those articles and associated recovery discussions are included in the sample results. But the issue became one that bordered on scandal as community leaders were accused of conflict of interest and water systems became more expensive than anticipated; so while articles reporting this information certainly carried the potential to affect survivors of these incidents and their recovery, not enough mention tied the problem back to the wildfire; thus, 12 articles were discarded, despite a domino-effect connection to the Cedar Fire. Research of media effects that include examination of historic news content must allow for the possibility that narrow definitions for news content could eliminate news articles that would prove salient to the readership.

As the news flow model results revealed, the latest cycle for each incident contain the fewest number of articles printed, suggesting the least amount of information is offered. For the incidents in which personnel loss of life occurred, the sample revealed that articles addressed primarily fundraisers and investigation and minimal news of updates on closures / reopenings, utility status, resources for



survivors, (other than voting while an evacuee) or other information, but plenty of articles profiling them and their struggles (12% of the total for these three collections, or 99 of 222 articles).

To truly assess the citizen agenda with regards to public perception of risk to hazard events like wildfire and effects of news media reporting of such events, it would be beneficial to examine the forums citizens have within news media, such as the opinion sections. Comparing those contributions to the discourse contained in news interviews might offer a valid comparison with the press agenda and further test agenda-setting theory in a precise way.

## CONCLUSIONS

Author and historian Mark Neuzil writes that the media's function in reporting on two Minnesota fires, 100 years apart, was reassurance, to restore order, sameness. He reached this conclusion after analyzing historic news content of the Hinckley Fire (1894) and the Ham Lake Fire (2007).

*"I have advanced the idea that in times of crisis, natural and otherwise, the media serve a social control function called reassurance, of which order restoration is a part. The system maintenance role means that when disaster strikes, one task the news media performs is to assure people that help is on the way, victims will be taken care of, towns will be rebuilt, a giant catalogue company may mail some shoes, and that, in short, the social system will right itself and is not permanently broken" (p. 18).*

This statement appears to align with Herman and Chomsky's media propaganda theory, which says news content is constructed to maintain social order (1988).

In assessing the potential effects of wildfire on people, Case, Banks, Butler, and Gosnell (2008) outline a spatial information system to assess who would be affected, how, and why in different wildfire scenarios in Colorado, applying recent U.S. Census data and current growth projections. Nowhere in that assessment is communication discussed.

Koebele *et al.* (2015) noted that outreach and "citizen entrepreneurs" proved successful in encouraging and communicating fireadapted.org campaign principles,

but that news coverage of the success of these campaign techniques in the Waldo Canyon Fire is what helped motivate these entrepreneurs.

So news coverage of hazard events is important. And when it's done poorly, it can be damaging. When it's done well, it can stabilize communities, for better or worse. Therefore, it is worthwhile to study news content for patterns and influences during these extreme events.

What this dissertation showed is alignment with prior research that aimed at smaller events applying similar theory. It also expanded results to defy prior principles that were expected, such as first reports of wildfire being framed as number of homes or businesses lost or threatened. While discussion of natural resources damaged or altered is less than balanced in news coverage, for the two incidents where endangered species were displaced or a massive amount of wildlife were deemed to be threatened (Long Draw, Murphy Complex) the news coverage was present and matched the amount of articles discussing economic effects of lost rangeland.

This dissertation follows a line of developing research examining the Issue Attention Cycle, framing, and source usage. Prior results are confirmed (Terracina-Hartman & Oshita, 2013; Bowe, Oshita, Terracina-Hartman and Chao, 2013; Terracina-Hartman, 2015 in press) but new avenues have been revealed to explore, such as specific expressions during a news cycle (e.g., as opposed to a broad label like "conflict") and comparing source expressions with events during these hazard events over time.

That the scientists as a category appeared earlier than prior studies predicted and that citizen voices (outside of the incidents with personnel loss of life) persisted into the last stages of coverage is worthy of further examination as well. What types of articles do these sources most appear in: investigative, round-up, follow-up, memorial commemorations? Such an analysis would reveal valuable insights about hazard reporting and the potential to identify a press agenda.

For the incidents in which personnel loss of life occurred, the type and tone of news coverage changed drastically. News of the fire itself altered, as did the sourcing trends, particularly for Yarnell Hill: 12 articles printed with updates and no cited source. Why is this? Does the readership perceive the risk as less of a hazard? It is worthy of study.

To truly assess the citizen agenda or effects of the press agenda on the readership, more than a count of sourcing is needed. The next stage is a survey on fire risk and perception attitudes linked with mass media consumption (Appendix C). The most recent survey of this type or topic occurred a decade ago as part of the Outdoor Health and Recreation Attitudes survey (Appendix B).

Given recent history-changing wildfires since then, the drastic loss of life, and population expansion into the wildland-urban-interface along with communication from firefighting agencies to direct more responsibility for fire prevention toward property owners, public perceptions may have shifted. It would be worthwhile to update and document this shift and the role news media may play. Crisis reporting focuses on news events post-occurrence, while hazard reporting has an opportunity to cover prevention messages. The two are distinct and deserve equal study.

## **LIMITATIONS**

This study has established that news coverage of wildfire has patterns that pertain to the type of incident, the region, the types of loss, and whether fire suppression efforts result in loss of firefighting personnel. It shows that news content across historically significant hazard events such as wildfire, that, until recently, have escaped the attention of social science scholars, often aligns with research results of smaller incidents over time, but not necessarily environmental reporting of policy issues like climate change. And lastly, it establishes a baseline knowledge of news coverage of historically significant wildfires that can lead to future work. These data offer solid evidence as to what makes the news and who has a claim to a voice and when. The key is comparing like incidents to establish whether a press agenda or a public agenda exists in comparison to a citizen agenda.

The limitations of this study are its single method of research and primary reliance on humans to peruse electronic databases and archive collections to collect news articles in a short time span. Ownership changes at one media conglomerate required a physical visit to the archives to obtain a complete sample; thus relying on research assistants to research and scan documents could miss important items due to fatigue and time allowances.

A longer time period and a healthier budget would permit access to library archives nationwide to fully research the depth and breadth of regional newspapers, rather than just those available in an index. The potential to miss news content because a newspaper isn't contained in an index is vast. Similarly, several media

conglomerates aren't indexed, which affects publications even prior to ownership. What rounded out the data collection were state forestry associations offering artifacts, such as literature and brochures on firefighting and journal articles reporting on major wildfire events. Also, copies of Smokey the Bear posters arrived, with copies of history books documenting the ad campaign and the actual bear. Such items enhanced the data collection and contributed to the discussion of how society's relationship with wildfire developed, from suppression techniques to roofing choices.

Additionally, forestry schools and regional forest science laboratory offices and commissions (Georgia, Idaho, Florida, Washington, California) as well as the NIFC office in Boise offered tremendous historical resources – wildfire data, archive publications, photographs – that contributed significant perspectives on forest fire suppression policy and public perceptions of risk. It is possible these contributions helped offset the limitations of using electronic news databases for gathering news content to conduct the analysis of historic news content.

But it must be acknowledged that studying only newspapers limits the depth of the effects of media coverage on the readership. Wildfire makes for great art and newsmagazines are known for extensive photo essays of these extreme events. Including news magazines alongside newspapers for a comparison of news frames and news treatment would add richness to the analysis. Rarely are articles in newsmagazines written without sources and reliant on wire services such as Reuters or The Associated Press with unclear publication dates or distribution. Additional studies might examine the broadcast news coverage and discern which

events make the news, at what point in the incident, for how long, and what leads the coverage: Flames, evacuation, air attack.

Further limitations include the use of coders. Any such study involving coding articles for any length of time risks errors due to coder fatigue, distraction, boredom, and other factors. A topic such as this is tough reading. Even an incident that produces a small collection, such as the 2006 Texas Panhandle fires of 38 articles, is a burden to read and code just for the amount of loss and devastation that is contained in the content. Factor in a bigger collection, such as the 2003 SoCal Complex, with a loss of life, and it's difficult to keep the devastation and loss in the material from being an emotional burden.

This type of research does not require an IRB, but perhaps that rule should change. Alternatively, screening for coding assistants could be useful. While many joined the research team based upon recommendations from a professor familiar with environmental journalism, some students had backgrounds too geographically or historically close to these incidents to remain as detached as necessary to remain on the team long-term. Screening beyond skills or knowledge of journalism and journalistic practices might obviate such complications in future coding studies.

Additionally, many coders work remotely: They receive their collection, work on paper copies, and record their answers in an electronic interface by incident. It makes for easy review and easy cleaning. But it is also easy to suspect that some coders perceive all articles in the same fashion (e.g., articles about evacuation ending should be coded as such, but yes, they could be coded as one of the fire

threats). It is hoped requiring weekly status reports and check-in Skype sessions helped alleviate fatigue and obviate coding errors.



## **FUTURE RESEARCH**

Future research, as introduced in the Limitations chapter, needs to include a second type of media for comparison, whether it be newsmagazines or radio transcripts, to compare news frames and sourcing. In particular, a study should examine at what stage analysis of forest health and community growth occurs. Are humans unduly risking themselves and placing too much responsibility on firefighting agencies to save their lives all the while creating a fuel load in the forest with years and years of fire suppression? Asking citizens their perceptions of hazard, risk, and knowledge and adding this data to their level of media consumption could be revealing about attitudes toward fire and societal relationships with wildfire and the role mass media plays in the formation of these attitudes and behaviors. Additionally, these topics appear in news content, but further analysis of one incident across several types of media would add depth to discerning approach and agenda-setting.

Results from this history study suggest a few options for continuing research, namely pursuing the theme of loss of life in wildfire news coverage. The Yarnell Hill Fire takes its place behind Storm King Mountain and Mann Gulch with historic loss of personnel life. The first book was just published on this incident spring 2015, shortly after this study was completed. It's time now to analyze media coverage across several media and across all three incidents and look for trends. It is likely those found in this small project would be present and revealed on a greater scale. Results such as the discourse changing to focus on the firefighters and events to support the survivors and less coverage of the wildfires itself, but also the discourse on changing fire suppression policy comes into play. Because it never happens. And

the next time loss of life occurs on any incident, the issue is raised in media coverage: “oh yeah, the same officials promised a change in policy and procedure the last time we lost people.” Such an analysis of policy discussion and review and as it relates to communication with the public and prevention campaigns would be worthwhile on a grander scale.

Lastly, as discussed in the Conclusions chapter, a survey of media consumption prior to fireseason (July 1) and after any incident would reveal how and where communities receive their information and what influence media content might have on their perceptions of hazard wildfire presents as a daily and lifestyle risk. What steps do people take? Where do they obtain their information? What types of media do they consume during an incident and how does it influence their perception of its status (Appendix C). Such a survey would add to the research on social cohesion theory, but also the possibility of the presence of spiral of silence pressure during specific types of incidents. A plan for such a survey is in place, in six key counties of California for fall 2015.

Additionally, reviewing news footage from the local news affiliates could provide additional information on the citizenry’s consumption and perceptions of hazard and risk. Analyzing which incidents make the news, who is a quoted source, and what the severity frame is, could contribute to testing the efficacy of public service announcements and fire preparation and safety campaigns that seek to help citizens prepare for wildfire season.

## **APPENDICES**

## **APPENDIX A**

### **Coding Typology**

## **APPENDIX A**

### News Article Eligibility for Study

Our study examines reporting of 10 historically significant wildfires in U.S. history, 2003 – 2013. This is newspapers only, at this moment. And it's only news articles. We will do the newsmagazines and opinion material later when we conduct the survey. So be sure we have set aside those items (letters, op-ed, commentary, editorial).

Make sure the content you code is for your incident only and the 15-18 months surrounding the first flames. Calendar year (January 1) is first coding date.

A story may NOT be eligible for coding for the following reasons:

1. The story deals with historic weather information only (not fire related)
2. The story deals with opinion content
3. The story date is outside the time period for the incident
4. The story fails to offer new information
5. The story deals with side effects of wildfire, but does not discuss the fire.

6. The story deals with national government only.

### **Procedure**

Read the news article before coding. Verify in headline and lede (first two paragraphs) that it qualifies: it must identify the incident you are coding and contribute new information.

If you believe a story is NOT eligible for the study because it deals with excluded material noted above, go on to the next story. Contact your researcher if the story is ambiguous in its study eligibility. Make note of the headline and the newspaper and the incident and send along that information.

### **Framing Typology**

- \* Problem: what is the issue or party identified? As all articles deal with wildfire in some way, several sub-topics will be identified, such as lightning strikes, evacuation, suppression, water supply, mop-up, returning home, air pollution, supplies for firefighters, traffic jams, accidents.
- \* Actor: who are the parties referred to? live quotes or paraphrases (“according to” counts as do references to studies or data sources). Actors will be coded according to a category (firefighter, state official,

federal agency, NPO environment group, unaffiliated citizen, evacuated citizen, local official).

- \* Causal attribution: However the problem issue is identified, causal attribution will be operationalized according to whether there's blame for the issue attributed to either the cause of the wildfire, the reason the fire is not suppressed, or disagreement on the nature of fire and its potential to offer benefits.
- \* Make moral evaluation: wildfire is a natural occurrence with biological benefits; wildfire needs to be extinguished at all costs; wildfire evaluation is not mentioned.
- \* Treatment recommendation: provides specific information how solution should be enacted or offers a call to action to combat problem. This frame is tied closely to the problem definition: whatever the current issue is (risk, conflict, seek arson suspect) treatment recommendation will be operationalized as coding categories supporting a specific solution / call to action or deny there is a problem and do not respond.
- \* Other: What is news hook? (personality profile, location profile, historical review, incident response in or from another state, jurisdiction or agency, commentary round-up)

#### Code Sheet

- **Verify** [headline and lede: refer to incident]
- **Verify** [content is original newspaper, not duplicate]

if not, see content manager with incident name, newspaper name, article number

### **Frame analysis**

---

- **Coder [mark ID]**

1= Carol

2= Ben

3= Delwar

4= Justin

5=Savana

6=Brigitte

7=Alex

---

- **Basic Information [select one]**

- Wildfire Incident
- Alaska Taylor Fire 2004
- Oregon Long Draw 2012
- Old fire, Cedar fire SoCal 2003 Complex
- Texas Panhandle fires 2006
- SoCal complex 2007
- Idaho / Nevada Murphy 2007
- Arizona / New Mexico Wallow fire 2011
- Waldo Canyon Fire 2012
- Rim Fire 2013
- Yarnell Hill 2013



- **Newspapers: write in**

[by state]

USA Today

Christian Science Monitor

- **Size of the article**

Enter numbers/ word count

- **News Format [select one]**

1= Article with latest news

2= Investigation or series; time reference is to two or more days prior; content emphasis is on analysis; reportage, background

3= Round-up article: summary or digest of time span of activity

4= Interview, mainly

5= Update or follow to prior article

6= News brief (150 words or less)

7=Calendar item

8= Editorial (paper's editor)

9=Commentary from other people

10=Reviews of books, films etc.

11 = Standalone photo essay or graphics (with cutline or extended cutline)

12= Other

- **Section [select one, if applicable]**

- Write in [text box]

- **Byline [select one, if applicable]**

- Write in [text box]

- **Frame Elements [select one]**

- Problem Definition

*Issue:*

0=N/A

*[Fire Danger or Threat]*

1= fire danger or threat (e.g., threat of fire, nearby, or conditions contribute to risk and hazard; fire is nearby and conditions contribute to possibility of spread; may not be arrival of Initial Attack crew; may include updates with times and “Note to Eds.”)

2=severe weather (e.g., high winds, lightning storms)

3= early report of wildfire or wildfire siting (e.g., first reporting of flames)

4=reports of acreage threatened (or estimations of threatened acreage)

5=homes threatened (e.g., homes in predicted path of fire)

6=homes burned (e.g., estimated report of homes lost)

*[Environment]*

7=threats to ecosystem (e.g., water and air pollution; threats to natural

resources, habitat loss, timber loss)

8=threats to wildlife (e.g., avian life, marine life, forest inhabitants, urban wildlife)

9=scientific (e.g., predictions for fireseason, effects of climate change, precipitation predictions, water availability for fire suppression, weather reports) relating to wildfire

*[threat to community]*

11=health and medical threats (e.g., smoke exposure, water shortage, food shortage)

12=physical threats to population (e.g., roadblocks, utility loss, gas shortage)

13=population evacuation (e.g., orders for people to leave neighborhoods; some people follow order and some don't; others need rescue)

14=economic threats to community (tourism, loss of income or revenue, loss of history)

*[resources]*

15=personnel en route (e.g., air attack arriving, off-forest engine crew requested, smoke jumper assistance expected to arrive)

16=personnel deployed (e.g., reports of the number of crews of ff on the line, types of ff or crews on the line or aiding fire suppression from the air, or staffing a water tender or jumping in to cut line)

17=personnel leaving (e.g., ff, crews, engines, planes or more heading home or

to other incident)

18=cost of suppression (e.g., officials estimate the cost of crews, supplies, water supply, or other tools involved in fire suppression; discussion may be compared to budget amount allocated in anticipation of fireseason predictions)

19=cost of losses / damage (e.g., officials begin to offer estimates of damage and what they may cost in terms of value and also repairs)

20= little or diminished resources to fight wildfire (e.g., need more resources, crew, equipment, outside support, etc. for containment)

*[conflict]*

21=political statement (e.g., official declares state of emergency)

22=political conflict (e.g., firefighter pay, overtime battles, benefit battles for firefighters, policy struggles over grazing and land use)

23=agency conflict (e.g., miscommunication between agencies, redevelopment struggles, scrutiny of agencies for suppression strategy, agencies differ on approach for containment, strategy toward fire suppression,

24=insurance conflict (e.g., citizens struggle with process of filing claims; level of fraud in representation;

25=legal matters (e.g., investigation, arrest, charge and conviction of arson suspect; fraud issues with insurance company)

26=population refusing to evacuate (e.g., citizens can't leave; citizens won't leave; citizens fail to receive evac order)

*[recovery]*

27=donations needed

28=recovery plans or discussion

29=safety or evacuation over (resources, shelter info, clean water)

*[loss]*

30=loss of life (e.g., citizens)

31=loss of life (e.g., agency personnel)

32=loss of life (farm animals or companion animals)

33=loss of life (wildlife)

Other (please specify)

▪ **Actors [mark all that apply by frequency]**

*[firefighting / law enforcement]*

1= firefighters: fed, state, local, volunteer; reports

2=officials of firefighting agencies; fed, state, local, volunteer; reports

3=police; sheriff; marshals; highway patrol; judges; reports

4=government agencies; National Interagency Fire Center; USFS (not fire crews); USDA; BLM; USF&W; NASA; reports

*[citizens]*

5=unaffiliated citizens

6=neighborhood associations

7=nonprofit environmental groups

8=protestors

9=bloggers / journalists

[scientists, researchers]

10=government scientists [NASA, NOAA]

11=university scientists / professors

12=industry researchers or scientists

13=think tanks

14=other scientists

[other actors]

15=timber industry representatives

16=business and industry trade groups

17=tourism industry representatives

18=farmers, ranchers

19=consultants

20=unidentified spokesperson or representative

[government officials]

21=elected officials (local, state, fed)

22=appointed officials (Cabinet, advisory)

23=officials of other nations

Other (please specify)

▪ **Causal Attribution [select one]**

Identify the cause listed in the article (please select one)

0= N/A

1= Government policy or land use planning

Keyword: with words “land management” “fuel buildup” “policy” appearing in the coverage

2= Funding or resources Keyword: “equipment” “personnel”

3= Nature Keyword: “lightning strike” “storm” appears in the coverage along with “high winds” and “high temperatures” and “dry” or “low humidity”

4= Human Keyword: “out of control” “campfire” or “flare” or any reference to an incendiary device (cigarette, for example) lit by accident or mismanaged; also “arson” or “illegal” or “accidental” near automobile appears in the coverage

5= Firefighting agency efforts communication Keyword: “miscommunication”

6= Citizen rescue or evacuation issues Keyword: “evacuation order”

7= Other (please specify)

▪ **Severity**

Which measure is first used to indicate the severity of wildfire incident and its risk?

*[fire threat to land]*

1=acreage threatened

2=acreage burned

*[fire threat to structures]*

3=homes threatened

4=homes burned

*[fire threat to humans]*

5=people evacuated (e.g., orders were issued, messages were sent and a community has to leave their homes, quick)

6=people not evacuating (e.g., some citizens are not able to leave their residence, some citizens choose to ignore the evac order)

7=crimes related to evacuation (threats between humans; people loot homes during evacuation order, people loot burned homes)

8=injuries (humans: e.g., people try to defend home, people hurt leaving, people hurt returning and surveying damage)

9=traffic jams, auto accidents (e.g., falling trees, wires block roads, crews block roads, evac stalls traffic, smoke interferes with visibility)

*[ecosystem]*

9=threats to wildlife (e.g., avian life, marine life, forest inhabitants, urban wildlife)



10=threats to environment (ecosystem, water and air pollution) and soil erosion,

11=loss of natural resources (timber, rangeland, water resources)

*[loss]*

10=loss of life (citizens, personnel, officials)

14=loss of life (farm animals or companion animals)

15=loss of life (wildlife, endangered species)

*[resources]*

16=personnel en route (e.g., crew coming to a fire)

17=personnel deployed (e.g., crew has arrived to a fire line, crew is working Air Attack, smoke jumpers have arrived and are on the ground)

18=personnel diverted (e.g., crew was requested, en route, but did not come to fire)

19=personnel requested (e.g., fire is growing, containment has not happened and more resources are needed)

*[cost]*

20=cost of suppression

21=cost of losses / damage

22=plans for recovery

23= Other (please specify)

▪ **Moral Evaluation [select one]**

0= N/A

1= Wildfire is threat to humans and must be suppressed always [e.g., coverage content emphasize discussion of suppression only]

2= Wildfire is a natural process and can offer biological benefits [e.g., coverage offers content that reflects all sides of wildfire discussion]

▪ **Treatment Recommendation [select one]**

0=N/A: They do not talk about the issue

1=Wildfire is risk and better strategy is needed to suppress every fire [e.g., coverage emphasizes containment, suppression efforts, steps toward containment as the role of wildfire in society]

2=Wildfire is nature and it's better to learn to live with it than try to suppress it [coverage emphasizes strategy to stay safe by practicing prevention; keyword, firewise, firesafe, fireadapted campaign; beneficial]

3=We do not know wildfire is risk or not/ If they talk about risk but not talk about the position they hold [coverage emphasizes wildfire as a presence in society but no acknowledgement of opinion]

## **APPENDIX B**

### **Wildfire Database**

## APPENDIX B

After The Big Burn of 1910 – the single largest fire in U.S. History – (3 million acres in Idaho, Montana and Washington with 87 fatalities), the handling of the blaze shaped the future of the U.S. Forest Service, U.S. Fish & Wildlife Service and firefighting policies. “Fight them all” was the directive.

– Bryan Nelson, 2013, *Mother Nature Network*

### Top Ten Worst U.S. Wildfires

Defined by at least one record-breaking statistic for U.S. history<sup>9</sup>

#### 1. Cedar Fire 2003 (SoCal complex)

- California
- lost hunter lights a signal fire 25 miles from San Diego
- 280,000 acres, 30,000 in San Diego proper
- this was the largest incident in California history
- 2,400 structures
- 15 lives lost

#### 2. Taylor Complex Fire: Alaska 2004

- 1.3 million acres
- largest on record in the U.S.
- Alaska had record-breaking fire season in 2004: 6.5m acres
- highest total in U.S. history

#### 3. California 2007: SoCal (16 incidents in October)

- largest evacuation in California history: 1 million displaced
- 500,000 acres, 16 wildfires in one week
- Santa Barbara to the U.S.-Mexico border
- 3 died, 25 firefighters and civilians injured
- 1,300 homes destroyed

#### 4. Texas Panhandle 2006: 200 fires in 24 hours

- destroyed 15 homes
- killed 10,000 cattle and horses
- burned 191,000 acres
- began as result of power lines downed by winds 46-53 mph
- deadliest wildfire month on record: USFS

#### 5. Murphy Complex Fire: Idaho and Nevada 2007

- 653,100 acres
- one of largest in Idaho's history (as recorded)

6. Wallow Fire: Arizona and New Mexico 2011

- 538,049 acres
- June-July
- largest single fire ever recorded in the lower 48 states
- 16 injuries
- damaged or destroyed more than 75 structures

7. Waldo Canyon Fire: Colorado 2012

- 18,947 acres
- destroyed 346 homes
- three deaths
- part of the worst year for wildfires in Colorado history

8. Long Draw Fire: Oregon 2012

- 30,000 acres the first night
- in 3 days, spread 870 miles
- 560,627 acres
- 150-year record

9. Rim Fire: California 2013

- Yosemite National Park, Fed and private: 13<sup>th</sup> largest in California history since 1932
- >257,314 acres
- passed through crown, canopy: largest loss of timber since 1932
- largest fire ever recorded in the Sierra Nevada mountain range
- reflects poor forest planting: plantations! too close together

10. Yarnell Hill Fire: Prescott Arizona June 30, 2013

- 19 Granite Mountain Hotshots crew lost
- 8,000 acres
- worst single loss of firefighters since 2001 terrorist attacks

<sup>9</sup>National Inter Agency Fire Center, Boise Idaho

[http://www.nifc.gov/fireInfo/fireInfo\\_stats\\_histSigFires.html](http://www.nifc.gov/fireInfo/fireInfo_stats_histSigFires.html)

## **APPENDIX C**

### **Survey**

## APPENDIX C

### Perceptions of Risk: Wildfire Survey From Bowker *et al.* 2008

#### Prefire management

Rate agreement 1 to 7 (1 being the least and 7 being the most) with the following statements:

Public land managers and forest professionals can be *trusted* to select the best methods for dealing with wildfire

Public land managers should use *prescribed fire* as part of a wildfire management program

Public land managers should use *mechanical vegetation removal* as part of a wildfire management program

Public land managers should use *timber thinning* to manage forest competition and fire fuel supply as part of a wildfire management program

#### Postfire management

It makes sense to *salvage* and sell timber damaged by wildfire on public lands

All wildfires should be *put out*, regardless of location

An area burned by wildfire should be left to *recover naturally*

Wildfires in *remote areas* should be allowed to burn if human life, property, or air quality or water quality are not threatened

#### Personal responsibility

People who choose to live near forests or rangelands should be prepared to *accept the risks* of wildfire

Where wildfire is common, homeowners should have to follow *government guidelines* to manage for wildfire risk

### Mass Media Usage Survey From Jacobson, Monroe, Marynowski, 2001

Learned of wildfire through mass media

Used media to track wildfire progression

Relied on mass media for personal behaviors

Expect mass media to provide updates

Use mass media for information during prescribed burns

Expect mass media to provide updates during burning season

**Experience**

Nearby natural area burned

Wildfire near residence

Smoke at residence

Evacuated from residence

Personal experience with wildfire

Personal experience with prescribed burning

Employment: natural resource or agriculture

Level of concern during wildfire

Level of concern during prescribed burning



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