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Best Practices in Disaster Public Communications: State of the Practice in Communicating Information, Building Trust and Compelling Action, Using Traditional and Social Media; and Developing a Cell Phone App

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TABLE OF CONTENTS

Executive Summary	1
Introduction	1
Report Organization and Findings	1
Conclusion	2
I. Introduction	3
II. Background Context	5
2.1 Fire Information	5
2.1.1. Firefighting in California	7
2.1.2. Fire Behavior	9
2.2 IPAWS and WEA Alerting Systems	11
2.2.1. AlertSCC Opt-in	13
2.3 Social Media and Situational Awareness	14
2.3.1. Data Scraping as a Tool for Situational Awareness	17
2.4 Community Stressors: Social Circumstances of Summer, 2020	18
2.4.1 COVID-19	18
2.4.2. Civil Unrest: George Floyd's Death	20
2.4.3. Understanding Distrust of Government	20
III. Literature Review	24
3.1 Online Media in Disaster Management	24
3.2 Building Trust through Online Crisis Communications	25
3.3. Strategies for Building Trust and Engagement	26
3.4. Motivating Action through Online Crisis Communications	27
3.4.1. Environmental Factors	27
3.4.2. Information Source	28
3.4.3. Warnings and Calls for Action	29
3.4.4. Receiver Characteristics and Perceptions	30
IV. Methodology	31
V. Findings	33
5.1 Public Messaging in the CZU Fire in Santa Cruz County, California	33
5.1.1. CZU Fire Facts	33
5.1.2. Evacuation Management	33

5.1.3. Evacuation Messaging Challenges	35
5.2 Public Messaging in the SCU Fire in San Jose, California	36
5.2.1. SCU Fire Facts	36
5.2.2. Evacuation Management	37
5.2.3. Some Solutions to Evacuation Messaging Challenges	39
5.3. Social Media and Emergency Communications	41
VI. Analysis	45
6.1 Actions to Take before Emergencies	45
6.1.1. Risk Assessment Tools	45
6.1.2. Pre-Disaster Public Education	45
6.1.3. Cultural Competency	46
6.1.4. Make A Media Plan	48
6.1.5. Offer Media Training for Elected Officials	48
6.1.6. Be A Trusted Source	49
6.1.7. Be A Trusted Source in Many Languages	49
6.1.8. Be A Local Authority for Information in Your Domain	50
6.1.9. Create a Sense of Community with the Public	51
6.1.10. Access the Social Media Platforms that Your Community Uses	51
6.1.11. Write for the Platform	52
6.1.12. Use Traditional Media Outlets	52
6.1.13. Involve Community Members in Emergency Preparation Outreach	52
6.2. Actions to Take During Emergencies	54
6.2.1. Use WEA, EBS and Alerting Technologies	54
6.2.2. Consider Time of Day When Communicating	54
6.2.3. Regular Briefings at a Convenient Location	55
6.2.4. Post on Social Media Regularly	55
6.2.5. Reply to Public Requests Quickly	56
6.2.6. Manage Rumors and False Information	56
Conclusion	58
Attachment 1: Catalog of Public Information Officer Training and Guidance Materials	59
Attachment 2: Catalog of Social Media and Trust in Government Researc	h 69
Attachment 3: Examples of Outreach Materials	74

vi

Attachment 4: PIO Checklists	92
Acronyms and Abbreviations	109
Bibliography	112
About the Authors	134

vii

viii

LIST OF FIGURES

1.	Cal Fire Regions	6
2.	California National Guard Task Force Rattlesnake Personnel	7
3.	Burning Understory, California Wildfire at Dusk	11
4.	Lopes' 10 "C"s for Effective Communication	46
5.	Northridge Earthquake, 1994: Cultural Competency	47
6.	PIO Training for Elected Officials	49
7.	Caltrans Press Conference	51
8.	San Jose RACES at Field Day Using Emergency Broadcasting Methods	53

LIST OF TABLES

1.	10 Largest Fires in California History to 2020	3
2.	August 17, 2020 Lightning Strike Fires	4
3.	Federal Agency Landholding by Acres, 2018	8
4.	Population Demographics: City of San Jose and Santa Clara, Santa Cruz & San Mateo Counties	19
5.	East Side Council Districts' Ethnicity	40

EXECUTIVE SUMMARY

INTRODUCTION

In August of 2020 Northern California experienced a dry lightning storm that ignited numerous wildfires, including two adjacent to San Jose, California. The SCU and CZU complex fires burned for weeks, with the SCU becoming one of the largest wildfires in California up to that time. This was also a period of social turmoil, with rising distrust of government nationally due in part to COVID-19 impacting individuals and civil unrest demonstrations regarding policing practices. When public agencies provided guidance and messaging to communities regarding the need to evacuate – or not – the public's general distrust of government resulted in slow responses or even disregard. The role of social media in community information sharing was also a factor in residents' decisions about evacuation. Residents engaged in what sociologists call "milling," seeking multiple sources of trusted information before deciding on a course of action. Unfortunately, wildfires are fast moving events with unpredictable trajectories, so milling means time lost for evacuation decisions.

REPORT ORGANIZATION AND FINDINGS

The need to evacuate some residents but not others during the SCU and CZU fires led to challenges in delivering emergency messaging accurately. Problems included technology functions, multi-agency coordination and community perception. This study investigates two questions.

- 1. What is the current state of the practice used by public agencies to communicate disaster information to the public, build trust and compel action? Using the SCU and CZU fires as examples, what current practices work well, which need to change to create community trust and action, and which need to stop?
- 2. How can information about the disaster response from traditional and social media be organized and disseminated in near real time to support geo-specific, accurate and timely emergency public information?

This report presents background information to make the challenges of the summer of 2020 clear, as they extended beyond the fire events. It discusses some of the challenges to trust in government raised by social media messaging across multiple domains, and it concludes with a list of best practices for emergency communication between public agencies and community members –before an emergency event and during an emergency event, which are also applicable after an emergency event, during the recovery and mitigation phases.

The last part of the report is a white paper that describes how social media and geo mapping might be used to provide better real-time information for community members and local government decision makers during disasters. Attachments include a catalog of resources for public information personnel training, resources for enhancing the use of social media to build trust in government, and examples of community outreach materials.

CONCLUSION

This research acknowledges the "critical role of the internet and social media in the political landscape" (Putnam & Garrett, 2020, p. 332) of 2020 and beyond. Therefore, public agencies need to adopt the best practices for public information and outreach before events, and to develop technology enhancements to improve alerting and warning at the beginning of rapid onset events. The proposed cell phone app would be a good addition to current methods.

I. INTRODUCTION

From August 15 through 19, 2020 the western coastal area of California experienced a dry lightning storm with "over 15,000 lightning strikes" (Cal Fire, 2021a, p. 20), which led to hundreds of ignitions in wildland areas. On August 17, 2020 alone, eight separate wildland fires – including six "complex fires" (multiple fires that had merged)—were declared in the western coastal areas, including California's largest (August complex), third largest (SCU complex), fifth largest (LNU Complex) and sixth largest (North Complex) fires (Cal Fire, 2021a) at that time.¹

Order	Year	Name	Acreage
1	2020	August Complex Fire	1,032,648
2	2018	Mendocino Complex Fire	459,123
3	2020	SCU Complex Fire	396,624
4	2020	Creek Fire	374,466
5	2020	LNU Lightning Complex Fire	363,220
6	2020	North Complex Fire	318,930
7	2017	Thomas Fire	281,893
8	2013	Rim Fire	281,893
9	2003	Cedar Fire	273,246
10	2012	Rush Fire	271,911

Table 1. 10 Largest Fires in California History to 2020

Source: Cal Fire, 2021a, p. 37.

In a uniquely demanding circumstance, two simultaneous major fires were focused on the San Francisco Bay Area counties: the CZU Complex Fire and the SCU complex fire, one on each side of San Jose, California, the nation's tenth largest city (Cal Fire, 2021a). This research used the San Jose experience with the SCU fire and the small mountain communities' experiences with the CZU fire as case studies of public communication and warning during fast-moving natural disasters.

¹ The Dixie Fire of 2021 has become the second largest fire in California history, burning 963,309 acres. (Cal Fire, 2022).

Table 2. August 17, 2020 Lightning Strike Fires

Jones Fire • Nevada County • consumed 705 acres • destroyed 21 structures

SCU Lightning Complex • Santa Clara, Contra Costa, Alameda and San Joaquin Counties • consumed 396,624 acres • destroyed 222 structures • IMT 6 deployed

LNU Lightning Complex • Lake, Napa, Yolo, Solano, Colusa and Sonoma Counties • consumed 363,220 acres • destroyed 1,491 structures • claimed the lives of five civilians • IMT 2 deployed

CZU August Lightning Complex • San Mateo and Santa Cruz Counties • consumed 86,509 acres • destroyed 1,490 structures • claimed the life of one civilian • IMT 3 deployed

Butte/Tehama/Glenn Lightning Complex • Tehama, Glenn and Butte Counties • consumed 19,609 acres • destroyed 14 structures • claimed the life of one firefighter • IMT 4 deployed

August Complex • Federal incident • Mendocino National Forest • consumed 1,032,648 acres • destroyed 54 structures • IMT 5 and 3 deployed to mitigate West Zone

North Complex • Federal Incident • Plumas National Forest, Plumas and Butte Counties • consumed 318,930 acres • destroyed 2455 structures • claimed the lives of 15 civilians • IMT 4 deployed to mitigate West Zone

Holser Fire • Ventura County • consumed 3,000 acres

Source: Cal Fire, 2021a, p. 9.

The need to evacuate residents in some jurisdictions but not others led to challenges in delivering emergency messaging accurately. Problems included technology functions, multi-agency coordination and community perception. This study is intended to investigate two questions.

- 1. What is the current state of the practice used by public agencies to communicate disaster information to the public, build trust and compel action? Using the SCU and CZU fires as examples, what current practices worked well, which need to change to create community trust and action, and which need to stop?
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II. BACKGROUND CONTEXT

2.1 FIRE INFORMATION

Wildland urban interface fires have long been a challenge in the western United States. Vast expanses of natural space and alternating cycles of drought and rain create the environment for fires to start and spread readily. In 1940 California's Associate State Forester, C. Raymond Clar, created the state's first wildland fire response model, using fire stations, lookouts and conservation camps to pre-stage fire resources for a 15 to 30-minute response time to reports of wildland fires. The same concept of operations is used today. The state is divided into Northern and Southern regions for the California Department of Forestry and Fire Protection (Cal Fire), with sub-units consisting of several counties each. The CZU includes Santa Cruz and San Mateo. The SCU includes Santa Clara, Alameda, Contra Costa, and parts of San Joaquin and Stanislaus Counties (SCC Fire, 2019). The southern border of the northern region consists of the southern borders of Santa Cruz, Santa Clara, Sacramento, Amador and Alpine Counties (Cal Fire, 2021a), as shown in Figure 1.

In the 21st century scientists and government leaders alike have recognized that the global climate has been changing, becoming hotter and drier (NASA, 2021), leading to more wildland fires (US EPA, 2021). Climate-related environmental factors like rising temperature, lightning strikes and precipitation levels—including regional droughts—can "influence the likelihood of ignition, where and how quickly a fire spreads, and how big it gets" (US EPA, 2021, n.p.). California's *Fourth Climate Change Assessment: California's Changing Climate 2018* states, "Climate change will make forests more susceptible to extreme wildfires" (p. 9). As the surface of the Earth heats, wildland fires have become more frequent (NASA, 2021). California's Secretary of Natural Resources, Wade Crowfoot, has noted, "We have a perfect storm of conditions driven by climate change, creating these catastrophic fires" (Cal Fire, 2021a, p. 7).



Figure 1. Cal Fire Regions

Source: Cal Fire, 2016, https://www.fire.ca.gov/media/2135/admin_units_13.pdf

2.1.1. Firefighting in California

In California there are multiple levels of government involved in firefighting. Many small towns and unincorporated places have volunteer fire departments, made up of residents from the area who have paying jobs in other professions. In 2021 California had 806 fire departments registered with the National Fire Administration, of which 29% are all volunteer departments, 27% are mostly volunteer, with a few paid positions like dispatchers, and 15.7% are mostly career personnel with volunteers in specialized positions. These positions augment paid personnel in times of high demand, or as "paid call" fire fighters who volunteer for routine duties but are paid for actual fire response (National Fire Administration, 2021).

Only 28% of California fire departments are fully staffed by career personnel. These departments are mostly found in larger cities or in urbanized counties, which comprise about 5,299,000 acres (USDA, 2017) and hold about 95% of its population (Iowa State University, 2021). Cal Fire is mostly staffed by career personnel, but during wildland fire season it is augmented by outside personnel. In the 2020 fire season, personnel came from Canada, Mexico and Israel to help fight the multiple major fires that were burning at once. The California National Guard (CNG) provided specially trained personnel and equipment in response "packages" to provide support as hand crews and for specialized services. They created ten fire crews in Taskforce Rattlesnake, trained to remove vegetation outside of fire season as a fire prevention measure, and as suppression teams in fire season (Cal Fire, 2021a).



Figure 2. California National Guard Task Force Rattlesnake Personnel *Source:* Unpublished photo, Sgt. Galen Yusfzai-Boggs, CNG.

Since World War II, the California Department of Corrections and Rehabilitation (CDCR) has trained low risk prisoners as wildland fire fighters as a possible career path (Escalante, 2019). These prisoners used to live in conservation camps and respond with Cal Fire staff (Cal Fire 2021a). However, after the passage of AB 109 in 2011, the CDCR has realigned its services to keep low-level offenders – those most likely to be trained as fire fighters – in their home county with diversion programs, electronic monitoring, and treatment programs rather than serving prison time (Lofstrom & Martin, 2015). Furthermore, due to COVID-19, many prisoners were released from state prisons early to stem the spread of disease (CDCR, 2021). As a result, 80 CDCR hand crews were lost, eight conservation camps were closed and there are fewer CDCR fire fighters available. To augment the Cal Fire personnel, members of the California Conservation Corps (CCC) have been trained, creating six fire crews assigned to six different units. Cal Fire also contracts with the private sector for specialized services like air operations (Cal Fire, 2021a).

The CCC and CNG personnel augmented the remaining CDCR hand crews, but at much higher cost. Inmates earn up to \$5 per day from CDCR, and \$1 per hour from Cal Fire (Escalante, 2019). CCC firefighters earn \$12 per hour (Glassdoor, 2021), while Cal Fire pays \$70,000 per month for a full CCC crew (Cal Fire, 2021b). CNG personnel are estimated to cost \$12,000 per month per soldier on the fire line, including support costs (personal communication, CNG sergeant, 7/9/21).

California's land area is about 100 million acres. About 2.2 million acres, which include parks and beaches, are owned by the state(NRCM, 1995). California also has many national parks and forests that are the responsibility of the federal government. The federal government owns 45.5 million acres, or about 45.5% of California's land (Congressional Research Service, 2020). As shown in Table 3, the land is owned by five federal agencies: Bureau of Land Management (BLM), US Forest Service (FS), US Fish and Wildlife Service (USFWS), National Park Service (NPS) and Department of Defense (DoD):

Bureau of Land Management	Forest Service	Fish and Wildlife	National Park Service	Department of Defense
15,088,090	20,791,505	296,899	7,612,898	1,703,741

Table 3.	Federal Agency	Landholding	by Acres, 2018
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Source: Congressional Research Service, 2018

Five federal agencies are responsible for fighting fires in different federal lands in California: BLM, FS, USFWS, NPS, and Bureau of Indian Affairs (BIA), which fights fires on tribal lands augmenting tribal resources, estimated to be about 520,000 acres (NRCM, 1995). The Forest Service hires seasonal fire fighters to augment the career personnel during fire season. Active-duty military personnel may also augment other federal firefighting agencies. Military bases generally have their own fire departments, often staffed with civilian federal employees who are career firefighters. The responsibility for firefighting may also be governed by the California Master Cooperative Wildland Fire Management and Stafford Act Response Agreement (California Fire Management Agreement), which

provides for shared services between federal agencies and Cal Fire to create efficiencies in fire management in some remote areas (Wildfire Intel, 2018).

California is divided into three types of firefighting responsibility areas. Local Responsibility Areas (LRAs) are generally densely populated urban areas where an incorporated city or county career fire department is likely to provide all aspects of fire service. Property owners generally receive fire prevention and suppression services as part of the public services covered by their property taxes. The Federal Responsibility Area (FRA) is generally the national parks and forests and other lands under federal control, as shown in Table 3. Fire prevention and suppression services are paid for from federal program funds, depending on the activity. Firefighting on agricultural lands is the responsibility of the owners. The rest of the state, including rural areas and state parks, are State Responsibility Areas (SRA) (ARC GIS, 2021). Fire prevention and suppression services provided by Cal Fire are partially supported by a fee paid to the State Board of Equalization by property owners with habitable structures within the SRA (Fire Safe Marin, 2020).

2.1.2. Fire Behavior

The presence of fuels, the topography of the land and the heat produced by the fire all determine the intensity of the fire (Randall, n.d.).

2.1.2.1 Wildfire causes

Wildland fires can start from a variety of sources. According to the National Interagency Fire Center, 87% of all wildland fires are started by humans, including from neglected campfires and open burning of debris, fireworks, faulty equipment operations and arson (National Interagency Fire Center, n.d.). While electrical transmission lines only cause about 3% of wildland fires, they tend to be among the worst fires, because the line failures tend to occur in remote areas, many also in windy areas (Morgan and Morgan, 2022).

Lightning is the main cause of naturally occurring wildfires. Researchers note that 70% of the acreage burned between 1992 and 2015 was caused by lightning strikes. In 2020 dry lightning led to a series of large "complex" fires, where individual strikes led to rapid fire spread (Cart, 2022). The SCU and CZU complex fires were both started by multiple lightning strikes during one night of dry lightning.

2.1.2.2 Wildfire Movement

Wildland fire moves through three mechanisms: convection, radiation and conduction. Convection is heat transfer through the hot air rising, which ignites the material above the fire. This also creates embers that rise and travel on the wind, causing fires ahead of the main blaze. The embers often land on and ignite buildings ahead of the fire. Convection explains why fires burn faster uphill than downhill. Radiation is the transfer of energy from a burning object to an object near it. Burning material in close proximity to other material – closer than 30 feet – can set it on fire. Conduction is the movement of heat through direct touch of one fuel to another, such as when a burning log ignites a tree that is next to or touching it.

2.1.2.3 Wildfire Weather

People understand that fire is driven by wind, but few understand that fire creates its own weather. For example, wildfires can create tornadoes and thunderstorms (Jones & Carvahlo, 2020). Professor Craig Clements, who researches wildfire weather in real time, explains, "The extreme heat of the fire causes air to rise quickly, creating fire-induced winds. These winds sometimes help the fire spread more quickly and can arise even if the location of the fire wasn't particularly windy before the blaze started." Fire can also create clouds. "If a blaze is large and creates particularly strong updrafts, that can then cause clouds to form. These clouds are sometimes called 'fire clouds' or 'pyro cumulous clouds.' Sometimes, a large fire can create a thunderstorm, called a 'pyro cumulonimbus cloud' " (Secaira, 2022).

2.1.2.4 Wildfire Spread

Wildfires also spread quickly by using the forest undergrowth as fuel. The LNU complex fire grew ten-fold in 36 hours while the CZU fire quadrupled in size in one day (Serna, 2020). Researchers have determined that the dryness of the fuel and the wind speed are the major factors causing large wildfires. The three layers of the forest vegetation interact to encourage clearance of the under layer of leaves and dead material, while maintaining the health of the large trees, whose bark protects them from the lower-temperature understory fires. Success in fighting wildland fires is based on the speed of the initial attack, keeping the fire size small, and keeping the fire in the understory. While the mid-story trees can provide fuel for fires, they can also create wind drag and moister vegetation, which can slow down the fires. A large supply of dry material on the ground can act as tinder and create temperatures that can ignite the mid-story trees (Banerjee et al., 2020). Fire breaks and back fires can be effective tools against fires in the lower levels of the forest. (CNG Sergeant, personal communication, 7/9/21).



Figure 3. Burning Understory, California Wildfire at Dusk *Source:* Unpublished photo, Sgt. Galen Yusfzai-Boggs, CNG.

When fires get into the forest canopy, they are much harder to fight. Wicking occurs when understory fire travels up the mid-story vegetation and sets the taller trees on fire. This is called a fuel ladder that leads to a crown fire that burns the canopy layer, and is very difficult to fight (National Park Service, 2017; US Forest Service, n.d.a.). Drought conditions weaken trees, making them more susceptible to bark beetle infestation and damage. After California's last severe drought, many more mature trees died or became weakened and were infested with bark beetle (CalFire, 2019). These dead trees throughout California's forests are too numerous for easy culling, so they stand as potential wicks for fire to travel into the canopy (Cal Fire, 2019; US Forest Service, n.d.b.). In 2017, Cal Fire estimated that there were 102 million dead trees in California's forests (CalFire, 2019).

2.2 IPAWS AND WEA ALERTING SYSTEMS

In 2006 as part of the White House's post-Katrina emergency management evaluation (Townsend, 2006), Executive Order 13407 directed the Federal Emergency Management Agency (FEMA) to create the Integrated Public Alerting and Warning System (IPAWS) to modernize the way emergency warnings were disseminated to the public (FEMA, 2021a). In 1963 the Emergency Broadcast System (EBS) had been established, allowing the federal government to use a system of sirens, and radio and television announcements, to warn the public of impending enemy attacks. The counties around the country controlled the siren systems—while the federal agencies controlled the 34 Primary Entry Point (PEP) stations that received the messages for radio and television dissemination—and each

spread the messages out to the pre-designed network of stations for broadcast. In 1997 the Emergency Alert System (EAS) replaced EBS. Although the PEP stations remained, additional radio and television stations were added that could receive digital warning notices directly. The National Weather Radio System was included in EAS and developed its first computer synthesized voice system for delivering weather alerts (DHS, 2007).

Until 2000 users relied on dial-up telephone connections to access internet services (Beckett, 2022), but broadband became available to most subscribers by the middle of the decade. This system allowed users to make phone calls and use the internet at the same time, providing high speed data transmission. Broadband can be provided by telephone companies, fiber optic cable providers, satellite or wireless companies or electrical utilities (<u>HealthIT.net</u>, 2020). Both IPAWS and WEA depend on broadband services to carry their messages.

Work on IPAWS began in 2004 and was later established as a response to the 2006 Hurricane Katrina report (DHS, 2007). Under IPAWS, states and local governments that were designated as Alerting Authorities were permitted to originate messages using "compatible alert information software" (FEMA, 2021a, p. 1) that formats the messages for IPAWS use. More than 1,500 organizations at all levels of government have been authorized to issue emergency messages for natural, human caused and technological emergency events (FEMA, 2021a). IPAWS integrated a variety of existing alerting and warning technologies described above. Recognizing the variety of information pathways that had been developed, IPAWS was intended to ensure that emergency messaging across all platforms was uniform and rapid. IPAWS messaging might originate from the Amber Alert, Chemical Stockpile, National Attack Warning Advisory System (NAWAS), and NOAA weather radio, as well as the EBS feed to broadcasters. The message would be disseminated through the usual EASs broadcast channels, as well as to landlines, cell phones, pagers, and similar devices. Handheld communications devices, road signs and the internet were added to the traditional outlets in IPAWS. Public radio stations were added to the PEP network. By the end of 2006, 97,000 NOAA weather radios had been distributed to public schools, and in 2007 more were purchased for non-public schools, school district offices and higher education institutions (DHS, 2007).

Established by the Federal WARN Act in 2012, the Wireless Emergency Alert (WEA) network sends emergency messages to cell phones and similar devices that have been identified based on a variety of technologies. The expanded warning outlets would allow the public to receive emergency messaging through their mobile and fixed devices, wherever they were, and whether or not they had radio or television turned on, as long as there was cell phone service (DHS, 2007).

Messages that originate with an authorized local government, such as Santa Clara County (FEMA, 2021b), are created using a special tool that includes definition of the area to be notified. The messages are then disseminated through the Wireless Emergency Alert (WEA) network to cell phones, tablets and similar devices (FEMA, 2016). The messages are limited to 360 characters (National Weather Service, 2019). The IPAWS technology is designed to improve the geographical accuracy of message delivery, if the cell phone handset includes GPS-assisted location information. The messages are intended to be delivered to everyone with a cell phone within the polygon defined by the message

originator. The message and GPS coordinates are broadcast to the phones in reach of the towers, and the phones either display the text, or its software determines whether the message should be displayed, based on the phone's location inside or outside of the polygon. The goal is to avoid over-notifying by aiming for no more than a tenth of a mile outside of the polygon. However, due to the placement of cell towers, messages may be delivered farther outside of the target area (FEMA, 2021c). FEMA warns that "alerts will overreach until technology catches up to FCC requirements" (FEMA, 2021c, p. 2) for geolocation technology in cell phone handsets.

The IPAWS and WEA systems still have significant deficiencies. First, the system does not easily accommodate messaging in multiple languages. Since about 10% of working age adults in the United States have limited English proficiency (Wilson, 2014), and in San Jose, California, 57% of the populations speaks a language other than English at home (US Census Bureau, 2019a), this means that large segments of the population may be unable to understand an emergency message well enough to act on it.

Second, IPAWS and WEA do not reach all those needing to get emergency messaging. Although broadband has become common throughout the United States, broadband access is influenced by age, income and education. The Pew researchers found that about 75% of American adults have a broadband connection at home. About 15% of American adults have smartphones but do not have internet at home (Pews, 2021). Additionally, tribal areas are often rural, with only 65% of the population having basic broadband access (FCC, 2020). Computer-based alerts would not reach the 35% of residents without broadband access, meaning that local authorities would have to develop alternative means of emergency contact. Planning for these types of emergency messaging is essential to ensure that those at risk in an emergency can take appropriate action.

Third, cell phone users have been known to block WEA messaging due to perceived over use during the COVID-19 pandemic. WEA messages look like other texts on cell phones, creating a sense of clutter and overuse that frustrates some users (Ellsessor, 2021).

Fourth, cell towers are often damaged during wildfires. University of Wisconsin researchers determined that about 25% of the US population lives in an area served by cell phone towers that are at risk during wildfires. This is 430,000 cell towers and 85 million people. California, Florida, Texas, Georgia and North and South Carolina have at least 5,000 towers in high fire-risk areas (Barncard, 2020), complicating planning for IPAWS and WEA messaging. However, the researchers noted that the loss of power to the cell towers caused by wildfire may be a greater danger than the destruction of the towers themselves. More than 80% of California's 9-1-1 calls come from cell phones, demonstrating the importance of resilience activities for cell towers, especially creating fire resistant spaces around the towers and their pack-up power supplies (Barncard, 2020).

2.2.1. AlertSCC Opt-in

Santa Clara County has an official public alert and warning system, called AlertSCC, which is free to anyone who signs up for the service. Messages that originate from the county's emergency management agency can be delivered to a mobile device, landline

phone or email. Alerts are provided for fires, earthquakes, severe weather and crimes. The messages include directions for actions during a disaster (Santa Cara County Office of Emergency Services, 2022). The service is delivered using the Everbridge Mass Notification application, which promises to notify both residents and visitors in a specified area. Everbridge notes that all mobile devices are covered without opt-in by the owner, using Everbridge one-to-many technology; although as noted above, users may block WEA messages, which they deem overused. They also broadcast to any location-based SMS or traditional media with opt-in. The tool is capable of enabling "public authorities [to] create and control geo targeted public alerts to an affected area or at countrywide scale" (Everbridge, 2022). However, the message is only delivered in English, and only in places with broadband service.

2.3 SOCIAL MEDIA AND SITUATIONAL AWARENESS

Like public emergency management organizations, large private corporations often employ operations centers to gather intelligence and help mitigate, respond to, and recover from incidents. The goal of private operation centers is to protect company assets, employees, structures, and board-mandated principals. Operation centers are formally known as fusion centers, global security operation centers, and intelligence operation centers. Information is gathered on the ground level by Intelligence Analysts and then disseminated throughout the organization for situational awareness, which is "the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning, and the projection of their status in the near future" (Endsley, 1988, p. 97). In simple terms, it is the awareness needed to "move about, operate equipment, or maintain a system" (National Research Council, 1998, p. 172). The primary tool used by intelligence analysts in the technology sector to develop situational awareness is social media review, retrieved through data scraping.

Actionable information comes into an operations center through data scraping programs and interactive crisis mapping technologies. Data scraping programs draw information from open-source social media posts and online material (Zheng et al, 2011). Intelligence analysts typically receive these alerts as email notifications (Alan Barner, personal communication, January 16, 2022). Some popular platforms that data scraping programs draw information from include Twitter, Facebook, Instagram, Nextdoor, Reddit, and Periscope. Warnings from organizations such as USGS, AMBER, Storm Watcher, Travel Tracker, and other outlets are also reviewed by operations center personnel for validity and to determine whether an incident will impact the company's operations (Alan Barner, personal communication, January 16, 2022).

Once an operations center receives an alert, intelligence analysts check the source of information to help determine validity. Depending on the potential impact of an incident, one or more analysts will investigate the information. In the case of a social media post, intelligence analysts will check for location and geotags (Alan Barner, personal communication, January 16, 2022). In addition, analysts check certain aspects of a profile, such as the time zone, the number of followers, and whether the post is coming from a real account. Analysts may also check whether the post was original or re-posted by an individual, and verify that the language contained in the post is relevant. Key phrases

regarding a post are searched on social media websites to see if the topic is trending, or if other users are posting about a potential incident. Intelligence analysts explore hashtags to determine whether the information is widely circulating, and check social media profiles and websites of public organizations to help verify information, especially in the case of a fire or natural disaster (Alan Barner, personal communication, January 16, 2022).

Once information is deemed credible, an intelligence analyst will place the information regarding the event on a crisis map, or edit information on the crisis map, to reflect a more accurate representation (Alan Barner, personal communication, January 16, 2022). A crisis map is a tool that allows the intelligence analyst to visualize an incident and its potential impact (Avvenuti, 2018). Placing data into the crisis map enables stakeholders to view the general location of a specific incident. Crisis mapping technology is updated through maps posted online by public organizations, such as in the case of the CZU and SCU fires (Tech Industry Security Department Management, personal communication, January 16, 2022). Leaders in the technology industry integrate critical company information into crisis maps, such as visual representations of buildings, employee home addresses, and other assets (Tech Industry Security Department Management, personal communication, January 16, 2022). Distance measuring tools are also available on crisis maps so that the analyst can measure the proximity of an incident to company assets (Alan Barner, personal communication January 16, 2022). Crisis maps used by industry leaders in social media are integrated with alert messaging systems (Everbridge website, 2021, n.p.). The information published on a crisis map by an analyst will then directly populate into an alert messaging system, go through review by management, and be sent out to the relevant stakeholders based on its severity (Tech Industry Security Department Management, personal communication, January 16, 2022).

If an incident is potentially immediately impacting business operations, members of an operations center will directly reach out to stakeholders in conjunction with sending out written notifications (Alan Barner, personal communication, January 16, 2022). Since one significant aspect of incident response is timeliness, integration is crucial to the social media review process used by industry leaders in the technology sector. For example, data scraping tools are integrated with crisis maps, and crisis maps are integrated with notification systems. This integration helps to lessen the time in which information is reviewed and made available, and stakeholders notified (Tech Industry Security Department Management, personal communication, January 16, 2022).

Which stakeholders are notified for situational awareness depends on the severity level of the incident. Typically, stakeholders that may be notified include local security departments, campus-wide security departments, entire campuses and the employees who work there, board members, and high-ranking members of the company up to the CEO (Tech Industry Security Department Management, personal communication, January 16, 2022). Leading technology companies follow standard operating procedures to determine which stakeholders will be notified. Typically, notifications are reviewed and approved at the management level, and authorization level is based on potential impact of the notification (Tech Industry Security Department Management, personal communication, January 16, 2022).

In the case of wildfires, such as the SCU and CZU fires, intelligence analysts will look for three main assets that may be compromised. Intelligence analysts will first use information

from crisis maps to determine the proximity of a wildfire to any major campuses or offices (Tech Industry Security Department Management, personal communication, January 16, 2022). Intelligence analysts will also check the proximity of executive level or critical role stakeholders to events, such as a wildfire (Tech Industry Security Department Management, personal communication, January 16, 2022). Finally, intelligence analysts check to see the proximity of the home addresses of employees to the wildfire (Tech Industry Security Department Management, personal communication, January 16, 2022). Finally, intelligence analysts check to see the proximity of the home addresses of employees to the wildfire (Tech Industry Security Department Management, personal communication, January 16, 2022). If it is determined that the employee is within an evacuation warning or evacuation order, an intelligence analyst will then take action according to the standard operating procedure.

Although the general public is not considered an organizational stakeholder, if an intelligence analyst discovers information through social media monitoring that may affect the general public, they must report it to the appropriate parties (Tech Industry Security Department Management, personal communication, January 16, 2022). Typically, an intelligence analyst will present the findings to a supervisor, then escalate the concern to department-level leadership. Department-level leadership will then contact the necessary public agencies with the information discovered through social media reviews (Tech Industry Security Department Management, personal communication, January 16, 2022). If business operations or the public are in immediate jeopardy, the intelligence analyst may directly notify local law enforcement or other responding agencies. Triggering mechanisms for sharing information with public agencies depend on the nature of the online material and the determined severity level. Many times, triggering mechanisms that involve information sharing with public agencies involve threats of violence or potential criminal activity posted to social media.

In the case of incidents such as the CZU and SCU complex fires, leadership within an Intelligence Department will notify local officials less frequently, as compared to a violent threat discovered through social media review (Tech Industry Security Department Management, personal communication, January 16, 2022). One reason for less frequent information sharing is that much of the confirmed "valid" information gathered by intelligence analysts comes from the public agencies themselves, such as Cal Fire. An intelligence operations center will share information with public agencies during incidents, such as a fire, when they believe they have received information that public responders might not have (Tech Industry Security Department Management, personal communication, January 16, 2022).

One example of such information would be if a company employee living in a fire area has information that might assist an agency's response efforts. Another example would be if a live stream video is discovered online that the company believes a public agency may not be aware of. By the time a private organization reports information regarding an event such as a wildfire to a public organization, the public organization has already been made aware of the event in most cases (Tech Industry Security Department Management, personal communication, January 16, 2022). Online material may be shared with public agencies if it is determined that the information may directly threaten the public and that a public agency may not be aware of it (Tech Industry Security Department Management, personal communication, January 16, 2022). Instances such as these are rare, since the primary focus of the Intelligence Analyst is to monitor the impact of the event on specific company assets.

A significant aspect to note is that many individuals working in leadership positions within corporate security departments come from public agency backgrounds. From the management level up, many of these individuals have spent extensive time working for local, state, and federal law enforcement, as well as emergency response agencies. Due to this fact, many higher-ranking members in private operations centers have contacts within different public agencies to whom they will report information, if any potential impact may be outside the scope of the private organization (Tech Industry Security Department Management, personal communication, January 16, 2022). This same idea of information sharing also applies among the intelligence departments of different leaders in the technology industry. For example, were a threat to be received by one company that may have implications for another company, analysts at the company will escalate the information to management, who will then send the information over to the appropriate parties at the other company. Since many individuals work at more than one major technology company throughout their careers, they make professional contacts that are often used during such emergency events (Tech Industry Security Department Management, personal communication, January 16, 2022). Contacts are also made through information exchange at conferences and other events.

2.3.1. Data Scraping as a Tool for Situational Awareness

Public organizations can gather data through various social media websites using data scraping. Data scraping is the practice of analyzing large databases to generate new information (Zheng, 2011). Emergency managers receive information posted on social media platforms and then look for anomalies, patterns, and correlations (Zheng, 2011). The first step in data scraping for emergency management purposes is to collect raw data from social media platforms (Zheng, 2011). This raw data is collected using algorithms that identify key information relevant to the emergency manager (Zheng, 2011). During a disaster, raw data is generated in large quantities due to the public's attention to the event on social media (Zheng, 2011).

The next step in data scraping is data selection. Data selection is the process of determining what raw data is relevant or valuable and what raw data is useless (Zheng, 2011). The data becomes target data once selected by the emergency manager (Zheng, 2011). The target data then goes through processing to determine whether the data is accurate or credible (Zheng, 2011). Finally, target data is compared with other data or information collected on social media to determine whether it is an outlier, or whether any information is available to support the target data (Zheng, 2011). Emergency managers can then use this information to determine how to respond to a given event and send out large-scale public warnings. When data scraping, the challenge that arises for emergency managers involves deciphering what information coming from social media is accurate and what information is inaccurate (Zheng, 2011).

Most data scraping software incorporates a machine learning mechanism that determines what information arrives as a notification. Machine learning mechanisms scan social media posts for certain identifiable information that may be useful to the organization (Lazreg, 2016). A machine learning mechanism aims to weed out as much inaccurate or irrelevant information as possible during the data scraping process. For example, machine learning mechanisms built into data scraping programs look for words, key phrases, time, listed

locations, hashtags, and geotags (Lazreg, 2016). If a post on a social media site has met the criteria programmed into the machine learning mechanism, a notification goes to the intelligence analyst.

Although machine learning mechanisms help cut down on the number of irrelevant information items data scraped from social media, most of the information received by intelligence analysts working for industry-leading technology companies is irrelevant or inconsequential. The problem with machine learning mechanisms in data scraping is due to the nature of social media (Lazreg, 2016). Many users do not post their locations on social media, or their listed site might be outdated. Machine learning mechanisms also can be misled by automated bots or outside groups attempting to take advantage of a trending hashtag (Gupta, 2013). Additionally, machine learning technologies have difficulty interpreting slang, abbreviations, and shorthand spellings often used online. In addition, character limits affect a post's length and do not always paint a complete picture.

Another problem that machine learning technologies face involves identifying society's markers, which have multiple meanings (Grace, 2021). For example, a machine learning system may not determine if a reference to "Jefferson" is a street, city, county, or person. For these reasons, all data scraping technologies, even those using machine learning filter systems, require an intelligence analyst to make a final determination as to whether a piece of information is valid or relevant (Grace, 2021).

2.4 COMMUNITY STRESSORS: SOCIAL CIRCUMSTANCES OF SUMMER, 2020

2.4.1 COVID-19

On February 6, 2020 the first US COVID-19 death occurred, and it was in Santa Clara County (Chappell, 2020). The source of the COVID-19 virus is believed to be Wuhan, China, where the virus jumped from bats to humans through a still-unknown mechanism. The San Francisco Bay Area has close social and economic ties to China (Kelliher, 2020), so initially only people with recent travel to China were tested for COVID-19. By March 13 there were 66 confirmed cases of COVID-19 in Santa Clara County, including patients in the intensive care unit. By March 16, 2020 Dr. Sarah Cody, the County Health Officer, had declared a shelter-in-place order for all residents except essential workers, with all schools and most businesses closed (Cody & Williams, 2020). The eight Bay Area health officers issued concurring orders the same day.

On March 19, California Governor Gavin Newsom followed with a statewide shelter-inplace order, exempting only critical economic activity and the health care system (Office of the Governor, 2020), meaning that workers in those sectors would not be able to work from home (Casteneda & DeBolt, 2020). As shown in Table 4, in Santa Clara County the majority of the population is people of color, who are the majority of workers in the essential functions of health care, food growing and processing, food service, gardening, public transportation, hospitality and janitorial sectors. In Santa Cruz County, 43% of the population is people of color, who are the majority of workers in the essential functions of health care, food growing and processing, food service, gardening, janitorial, and tourism sectors. In San Mateo County, the majority of the population is people of color, who are the majority of workers in the essential functions of health care, food growing and processing, food service, gardening, janitorial, public transportation and hospitality sectors (<u>COVID-19.ca.gov</u>, 2020).

Demographic	San Jose Factor	Santa Clara County Factor	Santa Cruz County Factor	San Mateo County Factor
Population			273, 213	766,573
Asian	35.9%	39.0%	5.3%	15.5%
Hispanic or Latino	31.6%	31.6%	34%	24.0%
White	25.7%	25%	56.8%	38.7%
Two or more races	5.3%	4.2%	4.2%	4.8%
Black	3%	2.8%	1.5%	2.8%
American Indian	0.6%	1.2%	1.8%	0.9
Pacific Islander	0.5%	0.5%	0.2%	1.5%
Foreign born	39%	39.2%	17.8%	34.8%
Speaks other than English at home	57%	53%	32.1%	45.7%
Median household income	\$109,593	\$124,056	\$82,234	\$142,641
Living in poverty	8.9%	6.1%	10.6%	6.1%
Median home value	\$864,600	\$984,000	\$756,600	\$1,089,400
Average monthly apartment rent	\$2,107	\$2,268	\$1,717	\$2,316

Table 4.Population Demographics: City of San Jose and Santa Clara, Santa Cruz
& San Mateo Counties

Source: US Census Bureau, 2019a, 2019 b, 2019 c, 2019d.

COVID-19 had a disproportionate impact on California's population of people of color. In 2020, before vaccines were available, the death rate was notably higher, with the Latinx population accounting for 40% of the state's population, but 60% of the COVID-19 cases and 50% of COVID-19 related deaths. The Latinx population also accounts for a high proportion of essential services workers, and frequently lives in multigenerational households, with 26.9% of Latinx families "living in high-exposure-risk households" (IHME, 2021). In 2020 the American Medical Association noted that 38% of the Latinx population in the US was mono-lingual Spanish speakers, making language a barrier to health information. Many also work in industries without health care benefits, and undocumented people may have limited access to health care programs (Robezniek, 2020).

While the Asian community in the Bay Area had experienced only 12% of COVID cases by 2021, despite being 35% of the population, specific professions have been the focus of much of the illness and death. For example, Filipino nurses account for 4% of all US nursing staff, but 24% of the nurses who have died from COVID-19 by 2021 (Cachero, 2021). Early COVID-19 data from 2020 showed that the East Side of San Jose had disproportionate COVID-19 impacts in zip codes that included Asian communities. Vietnamese community leaders noted the need for disaggregated data about the different Asian ethnicities, who have different underlying health concerns, and different socio-economic situations. in 2020 they noted that recent immigrants from India (mainly engineers and technology sector workers) had jobs that allowed them to work from home, while Vietnamese women's jobs in the beauty industry had been closed, so they had no income, and had to stay at home

with their children whose schools were closed. Vietnamese seniors suffered from mental health issues due to isolation at home (Herrera, 2020).

The SCU fire in August of 2020 came at the time of these existing community stressors, when most people had financial hardship and anxiety from COVID-19. The need to decide whether to evacuate because of the fires was an added stressor that led to distrust of government messaging.

2.4.2. Civil Unrest: George Floyd's Death

On May 25, 2020 an unarmed Black man, George Floyd, was killed by a police officer during an arrest in Minneapolis. Video of the event went viral on social media. Researchers from the Brookings Institution noted that "the video of his killing ricocheted around the web" (Wirtschafter, 2021). This event led to weeks of civil unrest over police department tactics, training and implementation. Violent protests took place in 140 American cities. Arson, looting and vandalism that often occurred at the same time as these demonstrations caused the largest insured losses related to civil unrest in US history, surpassing the United States' Rodney King riots in Los Angeles in 1992 (Taylor, 2021b, Manskar, 2020, Smith, 2020). Calls to defund police departments began in Minneapolis, where Floyd died, and spread across the United States. Budget cuts for police departments were announced in New York City and Los Angeles (Stockman & Eligon, 2020, p. A15).

San Jose, California was also the site of a riot in its downtown, near city hall. Demonstrators began a peaceful march to protest police tactics, but they were joined by people who began to vandalize property and set fires. The day of peaceful protest was followed by days of violence, including attacks on the police, who had been deployed to protect the city hall and downtown businesses. Police Chief Eddie Garcia called the event a "blanket of chaos," and "an insurrection of pre-planned violence and complete determination to destroy property that inserted itself in the crowd of lawful demonstrators" (Solonga, 2020). Social media posts did not separate the peaceful protesters from the vandals, as police used bean bag rounds and batons (Lawyers' Committee for Civil Rights of the Bay Area, 2021).

San Jose is one of America's most ethnically diverse cities, with 75% of its population people of color, although only 3% Black, as shown in Table 4. Hu (2020) postulates that the COVID-19 pandemic forced people to "live online," so social media images of the protests had a larger impact on people's attitudes toward civic engagement. Tufekci (2017) saw the internet as a "digitally networked public sphere" that shapes social attitudes and movements. The social media postings from the downtown protests galvanized community support against the police, leading to a class action civil rights law suit in federal court against the city for use of force against the protesters, especially people of color (Lawyers' Committee for Civil Rights of the Bay Area, 2021). When the lightning-caused fires began in August, there was anti-police sentiment in some communities.

2.4.3. Understanding Distrust of Government

At the end of World War II, citizen trust in government was high. From 1958 to 1964 trust in the government to do the right thing continued to rise. In 1965, 77% of Americans trusted

the government, but by 1978 only 29% expressed a high level of trust, undermined by divisions over the Vietnam War and the politically-motivated break-in at the Watergate complex. Trust rebounded under Reagan and Clinton, reaching a high point during the Bush Administration after the 9/11 attacks, "but plummeted... the standard index of trust in government now oscillates between 15% and 20%" (Putnam & Garrett, 2020, p. 103). Putnam and Garrett note that "falling trust in government is part of a larger pattern of rising political cynicism on the part of ordinary Americans" (Putnam & Garrett, 2020, p. 103). The implementation of government mandates related to fighting the COVID-19 pandemic added to both division and distrust in the American electorate (Silverman & Elwood, 2022).

Trust is the "firm belief in the reliability, truth, ability or strength of someone or something" (Devereux, 2021, n.p.). Esposti, et al. (2021) found that "institutional trustworthiness... [includes] benevolence, competence and integrity" (p. 862). Further, "to be deemed trustworthy, an institution needs to show caring commitment to act in the interest of citizens, an ability to do the job well, and a capacity to act with integrity" (p. 863). Trustworthiness is the belief that a third party, such as government agencies, can be depended on "in a situation of risk" (p. 863). These beliefs are developed over the long term, as "assessments of institutions thus reflect deeply held, long-term beliefs, dissatisfactions, or concerns, and are based on their experiences of the political system of which they are a part" (p. 863).

Devereux (2021) noted that federal leaders had "consciously and purposefully lied to the public about major policy initiatives" (n.p.), citing the Pentagon papers as an example. Many scholars have blamed the Trump Administration for rising distrust in government (Halpin, Teixeira, Molyneux, Nyak & Garin, 2018; Brooks, 2020; Friedman, 2018). Halpin et al. (2018) postulated that the Trump presidency solidified partisan divides, leaving "out party" citizens feeling distrust of the Trump Administration's management of federal issues, which spilled over into distrust of local government for some. Trust in local government "fosters mutual cooperation and public acceptance" (Esposti, et al., 2021, p. 863) of government initiatives, and is essential if the population is to support emergency response messaging. The public is "more inclined to cooperate with police officers they perceive to be competent, honest, and benevolent" (Esposti, et al., 2021, p. 863). At the midpoint of Donald Trump's presidency, Friedman (2018) noted that only one third of Americans trusted the government to "do what is right" (n.p.), a 14% decline from the previous year. Brooks (2020) suggested that trust in government was in "precipitous decline" caused by COVID-19, the social unrest over the murder of George Floyd and "social media mobs" (n.p.).

Pew Research Center researchers noted that trust of the federal government had been at a low ebb for a decade, even before Trump's election, so that by 2020 only 20% of US adults trusted the federal government to do the right thing (Pew, 2020). The Gallup Poll (2021) found that the events of 2020 even lowered trust in local government by 9%, the lowest level of trust in local government since the Great Recession (Riquier, 2021). Deloitte researchers found that the level of trust in local government depends on the agency being considered. Those perceived as retail-like agencies, that give things to or do things for the community, like public housing or transit agencies, are better liked than those perceived as regulators or enforcers. Notably, trust in police fell below 50% for the first time since Deloitte has been tracking it, a fact attributed to the media coverage of "police misconduct and subsequent protests" (O'Leary, Agarwal & Weille, 2021, n.p.). The intractability of the COVID-19 virus added to public distrust of government agencies and their representatives. Zak and Roberts (2022) found that infectious disease expert Dr. Anthony Fauci experienced a drop in confidence in his vaccine messaging (72% to 65%) in 2021. Fauci noted that "an almost incomprehensible culture of lies" (Zak and Roberts, 2022, n.p.) has invaded the public debate space usually reserved for science. Public figures like Neil Young, Joni Mitchell and Prince Harry and Meghan Markel have called out Spotify, for example, for perpetuating COVID "mis-information and dis-information" on its podcasts that feature "unfactual, misleading and false COVID information" (Rice, 2022, n.p.). Vilification by electronic media commentators and s ocial media "charlatans" led to "skirmishes over conspiracy theories and misinformation" (Zak and Roberts, 2022, n.p.) about COVID-19 that left many members of the public confused, and angry at the CDC, the government agency that is trying to save their lives. DeVoe (2022) notes, "Confusion leads to a loss of trust, and when you lose trust, you have lost the community (n.p.)."

Commentators decry Fauci's \$435,000 government salary (Zak and Roberts, 2022) as Chief Medical Adviser to the President and Director of the National Institute of Allergy and Infectious Disease (NIAID, 2021), while happy that an NFL quarterback earns \$24 million per year for entertaining people (Branch, 2021). But 900,000 people have died in the US from COVID-19 since 2020, and even with vaccines, social distancing, and masks, 2,000 people continue to die in the United States every day from COVID-19, mostly unvaccinated people who are refusing life-saving methods because of social media disinformation and trolling (Zak and Roberts, 2022). AIDS activist Peter Staley responded to the social media disinformation campaigns about COVID-19, "It's flat earth time. ... repeat the lie 100 times until people think it is true" (Zak and Roberts, 2022, n.p.).

Esposti, et al. (2021) found that "benevolence, competence and integrity are three contrasting belief systems with which citizens evaluate the trustworthiness of institutions" (p. 863). Deloitte's researchers suggest that restoring trust in government requires agencies to understand why they are not trusted now, and look for ways to overcome those barriers; and to understand which groups are especially distrustful and why (O'Leary, Agarwal & Weille, 2021). Wood, et al. (2018) observed that when people are told that there is an emergency and they need to act, they engage in "milling," calling friends, neighbors and family members to see what they are doing, how they are reacting, and whether they are trusting the government messaging. Mileti & Sorenson (2018) noted that public action is delayed while people look for multiple sources of information to create a new reality, a change from safety to danger. They search for more information, confirm the information with others, check out what others are doing, and finally, personalize the threat perception.

Trustworthiness based on benevolence requires that people believe that the government "agency understands the community it is serving, and is willing to act in its interest" (Esposti, et al., 2021, p. 864). National Public Radio reported on the Public Health Service's effort to vaccinate resistant Americans against COVID-19, many of whom lived in rural areas. For many, vaccine reluctance is related to a distrust of government. Rural physician Dr. Ada Stewart said that because her patients trusted her, they allowed her to vaccinate them when they visited her clinic for other reasons, even though they would not go to the public health vaccination sites (Keith, 2021). Democracies must accept that public opinion may include "feelings of opposition, avoidance and resistance to privacy violations" (Esposti,

2021, p. 869). Noting that the government "is not always the best messenger" (Keith, 2021, n.p.), Surgeon General Vivek Murthy supported the creation of a COVID-19 Community Corps, using friends, neighbors and family members to urge vaccination on the reluctant. Ultimately, trustworthiness requires that the public believes that the agency urging the action "adheres to an acceptable set of moral values" (Esposti, et al., 2021, p. 864). An increase in transparency enhances "perceptions of integrity, whether the agency will do the right thing and not abuse its power" (Esposti, et al., 2021, p. 869).

Better digital services have been found to enhance trust in local government, especially when they include data about what the agency is doing well for the community. Devereux (2021) noted that transparency is a pathway to enhancing trust in government. Humanity, transparency, capability and reliability are key factors in building community trust. "The journey to restoring trust should include not only measuring it, but also enhancing services and managing trust perception in a way that ensures the areas of weaknesses are addressed" (O'Leary, Agarwal & Weille, 2021, n.p.). It is hoped that the information in this report will support local government agencies to build greater trust during times of crisis among their community members.

III. LITERATURE REVIEW

Timely and accurate communication is a vital component of successful emergency management (Lindell & Perry, 2004; Mileti & Fitzpatrick, 1992; Reynolds & Seeger, 2005; Tierney et al., 2001), and interaction with the public is especially important as people seek to understand how they are affected by disaster events (Wray et al., 2008). Disasters are often unpredictable and unexpected, making them difficult and complex to manage (Tierney et al., 2001). Effective emergency communication with members of the public can provide lifesaving protective measures, facilitate relief and recovery efforts, and reduce public anxiety and fears (Sorensen & Sorensen, 2007; Stockdale & Sood, 1989; Wray et al., 2006).

A variety of traditional mechanisms exist for distributing public information in this context, including broadcast media (television, radio, and newspaper), sirens, phone messages, face-to-face interactions, and community meetings (Lindell & Perry, 1987). In addition, online media (e.g., websites, online platforms, blogs, and various forms of social media) have become an important communication mechanism for supporting timely and wide-spread interaction with the public (Denef et al., 2013; Hughes & Palen, 2012; Latonero & Shklovski, 2011; Palen & Hughes, 2018; Palen & Liu, 2007; Reuter et al., 2018). In a world where communication channels continue to proliferate and evolve, emergency managers often struggle to understand the most efficient ways to reach a public audience and to build trust in a way that encourages appropriate public response.

This literature review includes current research in the field of emergency public information communication, with a particular emphasis on the use of online media. The goal is to identify empirically supported best practices for building community trust, as well as ways that emergency managers can motivate the community to better respond to prescribed protective measures using online communications. Much of the disaster public information research is not about wildfire events. Communication practices for other event types, like hurricanes, have been studied far more broadly, and apply and are useful across a wide variety of disaster event types, including wildfire.

3.1 ONLINE MEDIA IN DISASTER MANAGEMENT

Traditionally, emergency managers have perceived public information work as happening over one-way communication channels (Palen & Liu, 2007)—flowing from response organizations to the public but not in the other direction. This perception has been challenged as emergency managers increasingly use online media (e.g., websites, social media) to communicate and interact with the public they serve (Denef et al., 2013; Hughes et al., 2014; Hughes & Palen, 2012; Latonero & Shklovski, 2011; Sutton et al., 2014). Through online media, emergency managers can reply to requests for assistance and seek information from a globally distributed audience at previously impossible speeds (Bruns & Burgess, 2012; Palen & Vieweg, 2008). Members of the public can also participate more broadly as they find, generate, and distribute online crisis information (Hughes, 2019; Palen & Liu, 2007; Perng et al., 2012; Qu et al., 2009; Starbird & Palen, 2011). In turn, emergency managers find that the online information the public generates during a crisis event can be useful in their own response efforts (Hiltz et al., 2020; Hughes & Palen, 2012; Latonero & Shklovski, 2011; Purohit et al., 2018). These new information flows—supported

by online media—have led emergency managers to rethink the one-way communication model in favor of a two-way model that accounts for new interactions between emergency managers and the public (Hiltz et al., 2020; Hughes & Palen, 2012; Plotnick & Hiltz, 2016).

Initial studies regarding online media use for emergency public information work focus on how emergency managers have adopted online tools like social media, and the challenges faced in fitting these new communication tools with needs and practice (Briones et al., 2011; Hughes & Palen, 2012; Latonero & Shklovski, 2011; St. Denis et al., 2012; Sutton, 2009). These studies reveal that despite the potential of social media platforms, their adoption as tools poses many challenges, such as issues of credibility and trust, lack of support from management, organizational conflicts, poor tools, and a shortage of resources and training (Hiltz et al., 2020; Hughes & Palen, 2012; Plotnick & Hiltz, 2016).

Many of these challenges still exist today. For instance, emergency managers often struggle to understand the validity of information provided by members of the public during a disaster and whether it can be trusted (Hiltz et al., 2020; Tapia et al., 2011). The COVID-19 Pandemic saw an abundance of misinformation shared across social media platforms (Brennen et al., 2021; Enders et al., 2020), making it difficult for authoritative public health and emergency management voices to be heard. There is also a general lack of good software tools for helping emergency managers sort through and make sense of the large amounts of social media data generated during a disaster event (Hiltz et al., 2020; Reuter et al., 2018).

As social media use by emergency managers has continued to increase, researchers have examined its use in a wide variety of events and contexts. The majority of studies in this area focus on Twitter use in events such as the London Riots of 2011 (Denef et al., 2013), the 2010 Deepwater Horizon oil spill (Sutton et al., 2013), the 2013 Boston Bombings (Sutton et al., 2014), Hurricane Sandy (Demuth et al., 2018), and Hurricane Harvey (Li et al., 2019; Mihunov et al., 2020). Twitter is commonly studied because 1) it is frequently used to communicate about a disaster event, and 2) the platform has a terms-of-use agreement that allows researchers to collect and study public data more easily than other platforms (Palen & Anderson, 2016; Reuter et al., 2018). Recognizing that Twitter is not the only social platform used during times of crisis, a growing number of researchers have expanded their inquiry to include content from websites, blogs, Facebook, and other social media platforms (Hughes et al., 2014; Qu et al., 2009; St. Denis et al., 2014).

3.2 BUILDING TRUST THROUGH ONLINE CRISIS COMMUNICATIONS

Studies have shown that community members are more likely to trust government entities that are familiar to them (Agency for Toxic Substance and Disease Registry, 2005). Members of the community are more likely to follow guidance from emergency managers if they trust them (Mileti & Sorensen, 1990; Rubin et al., 2012; Wachinger et al., 2013). The question then becomes, how can emergency managers foster trust within their communities? With growing concerns about misinformation and disinformation in social media (Nied et al., 2017; Starbird et al., 2019), it has become increasingly important that researchers understand what makes communication trustworthy and how trustworthy (and untrustworthy) information is perceived and spread (Chauhan & Hughes, 2020; Starbird et al.
al., 2016). "Trust lays the foundation for community cooperation... and for the community's willingness to ... respond to your recommendations" (Agency for Toxic Substance and Disease Registry, p. 4-5).

Trust has been studied in online communications during a disaster, but it is usually considered from the perspective of whether emergency managers can trust information provided by members of the public (Hiltz & Gonzalez, 2012; Mehta et al., 2017; Mendoza et al., 2010; Tapia et al., 2011, 2013). Emergency managers often mistrust this publicly generated information because they worry about misinformation, disinformation, false rumors, and poor information quality (Hiltz et al., 2020; Hughes & Palen, 2012). Early crowdsourcing research (Mendoza et al., 2010) found that false rumors on Twitter were frequently questioned and corrected by the crowd (i.e., others on Twitter) and suggested that this behavior might be a way to regulate social media and prevent the spread of misinformation. However, more recent work (Starbird et al., 2014, 2016) has shown that while the crowd will often correct misinformation, the rate at which misinformation spreads online often far outpaces these efforts. "Official" accounts, like those of emergency managers, can play a role in slowing the spread of false rumors and misinformation through posting denials or correcting information (Andrews et al., 2016).

3.3. STRATEGIES FOR BUILDING TRUST AND ENGAGEMENT

After examining social media messaging from police and fire departments following Hurricane Sandy, researchers (Hughes & Chauhan, 2015) offered a series of theorybased recommendations for emergency management organizations to build trust through online communications. First, they recommend that these organizations make themselves publicly visible online so that the community knows where to find them when a disaster hits. Many of the departments in this study did not have an online presence (i.e., a website and/or social media accounts) or it was difficult to find.

Another way Hughes & Chauhan (2015) suggest building trust and credibility is for emergency management organizations to be proactive in supplying timely and relevant information and correcting false rumor and misinformation. When organizations are not engaged in these activities, it decreases their credibility. The disaster-affected public appreciates emergency organizations that give regular status reports and that make efforts to build a sense of community. This includes engaging with the public on social media and replying to requests for information or assistance.

Emergency organizations can also build trust by being willing to adapt official procedures to address public needs (Hughes & Chauhan, 2015). An example of this adaptation happened during Hurricane Sandy when the 9-1-1 system in New York City was overloaded, and citizens were unable to reach responders to ask for help (Hughes et al., 2014). Affected citizens began posting requests for help on Twitter. A dispatcher recognized that these requests could not make their way into the regular dispatch system and began internally routing these requests to emergency responders. A similar situation happened during the 2017 hurricane season in the United States when 9-1-1 systems in several affected areas failed or became overloaded (Peterson et al., 2019). Peterson et al. (2019) found that social media became the default substitute for summoning help when 9-1-1 service was

unreachable. Service disruptions occurred in six states at 41 Public Safety Answering Points (9-1-1 centers) during the three Atlantic hurricanes in 2017. The challenge is managing the large quantities of data generated by the social media posts, and sorting out the actionable calls for service. Real-time social media analytics systems like CrisisTracker could help to sort through the big data to find actionable calls for service (Peterson et al., 2019).

Hughes & Chauhan (2015) further recommend that emergency management organizations should be local authorities for information in their domain (e.g., police for law enforcement, meteorologists for the weather), but reference others for information outside their expertise. Lastly, they recommend that emergency managers should make efforts to understand the different online communication platforms and how to write effective messaging for each.

Other studies have looked at how emergency management organizations can foster online engagement in different types of crises. One study (Denef et al., 2013) looked at two Twitter communication strategies used by two different police departments during the August 2011 UK riots. One of the departments used more formal and detached communication, while the other department used more informal and personal communication. The more informal department had better engagement with the public and their messaging was distributed more widely. However, their communication strategy also required more maintenance, and it more easily polarized public opinions. During the Deepwater Horizon Oil Spill, Sutton et al. (2013) examined the Twitter behavior of state and federal government organizations and found that the rate at which information spread was affected by structures created in Twitter, namely who was connected to whom (i.e., follower and following relationships). Briones et al. (2011) interviewed 40 Red Cross members about their social media use. These members felt that social media played an essential role in communicating and building relationships with members of the public. Research suggests that online tools, like social media, can play an important role when building and maintaining public engagement during crisis events (Kankanamge et al., 2020).

3.4. MOTIVATING ACTION THROUGH ONLINE CRISIS COMMUNICATIONS

A variety of factors can motivate members of a disaster-affected community. Lindell (2018) summarizes the research literature on communicating risk during a disaster event and discusses factors that affect how people receive and respond to warning messages. This section discusses the factors that most affect online crisis communications and how they can motivate action during an event.

3.4.1. Environmental Factors

A significant factor that affects how people respond to online disaster communication is where they are and what time it is when the event occurs (Lindell, 2018). The communication channels available to people and the ones they are actively monitoring change over the course of a day, depending on where they are and what they are doing. For example, people might use a very different set of communication methods when they are at work rather than at home. They may also be largely unavailable when sleeping or engaged in family activities. There is also the challenge of finding ways to communicate with people who are not typically in an area. For example, research highlights the challenges of communicating hurricane evacuation instructions to temporary residents, such as tourists (Cahyanto & Pennington-Gray, 2015). Tourists' cell phones might not be registered in the disaster area, so they would not be on the IPAWS or WEA notification list. If they would receive the notification, their knowledge of the area might be limited, making it hard for them to interpret the evacuation directions being received through other means, such as radio emergency alert systems. Therefore, it is important for emergency response organizations to understand the populations visiting and living in their community, and how they might best be reached through online platforms, as well as other communication means.

The public also relies on their senses (i.e., sights, smells, and sounds) to evaluate their environment and the risk a disaster might pose (Wallace et al., 2016; Weller et al., 2016). For example, people might respond very differently to a wildfire they can see approaching their home rather than one that they cannot see that is five miles away, but still poses a threat. In such situations, individuals might take a wait-and-see approach if the threat does not appear imminent (Edgeley & Paveglio, 2019; McCaffrey et al., 2018). If people see their neighbors evacuate, they are more likely to evacuate themselves (Stein et al., 2013). This research suggests that online communications could encourage compliance with evacuation orders if they include photos or videos that show the severity of the threat, or evidence that others in the affected area have already evacuated.

3.4.2. Information Source

The source of information also plays a role in determining how people will respond to calls for action during a disaster event. In a study of evacuation decision-making following Hurricane Sandy (2012), researchers found that affected residents talked more about receiving information from friends and family rather than traditional authority figures (Ploran et al., 2018). However, the study also found that residents were more likely to evacuate when the message came from traditional authority figures. In another study (Williams et al., 2018), researchers found that the public was more likely to trust social media from friends and family than emergency management organizations, such as local emergency response agencies, federal agencies, or non-governmental organizations (NGOs). However, when considering only these emergency agencies and NGOs, the public was more likely to trust social media from local emergency response agencies. These studies highlight the importance of local agencies building relationships with their communities that foster trust.

Research has shown that repeated messages across different communication platforms and from different sources (particularly trusted sources) are more likely to reach a broader audience and to get more compliance with protective instruction during a disaster event (DeYoung et al., 2016; Stephens et al., 2013; Taaffe et al., 2013; Wong-Parodi & Feygina, 2018). One study found that those who chose to evacuate had more dense and diverse social networks (Collins et al., 2018). In other research, people were more likely to evacuate if they had received communication from local emergency management organizations in addition to messages from family and friends (Basolo et al., 2009; Demuth et al., 2018; Huang et al., 2012). If emergency management organizations do not provide adequate information during a crisis event (online and through other means), members of the public are likely to seek it elsewhere, often through friends and family, but also through less reputable sources (Stephens & Malone, 2009; Sutton et al., 2008).

3.4.3. Warnings and Calls for Action

Much research focuses on ways that disaster warnings and evacuation messaging can be improved. Liu and colleagues (2017) empirically tested the use of maps in warning messages to the public and found that including maps did improve understanding. They also found that compliance with messaging was driven by the emotional reactions of the public and how well they understood the messaging. Similarly, Kankanamge and colleagues (2020) showed that, when emergency management organizations posted social media messages that included images or animated maps, the level of community engagement increased. Social media messages from emergency managers that shared situational awareness information received more attention than other messages (Kankanamge et al., 2020). A 2021 FEMA Report, Improving Public Messaging for Evacuation and Shelter-in-Place: Findings and Recommendations for Emergency Managers from Peer-Reviewed Research, recommends ways to improve public messaging for evacuation and shelterin-place orders (FEMA, 2021d). Many of their recommendations are included in this report. However, the report also includes many other recommendations that apply to communication channels beyond the online resources (e.g., social media, websites) that are covered here. This resource (FEMA, 2021d) can be beneficial for first responder and government agencies developing trustworthy social media programs.

Many of the communication channels of today (including many online platforms) only allow for short messages. Several researchers offer guidance on the most effective ways for emergency managers to communicate over these short messaging channels, like Twitter (280 characters), or Wireless Emergency Alerts (WEA) (360 characters) (Bean et al., 2016; Sutton & Kuligowski, 2019). Sutton & Kuligowski (2019) recommend that these messages be designed to grab attention, be easily understandable, and be sent from a trustworthy source. They further state that short messages should clearly describe the location and extent of the disaster impact, and offer protective measures that can be taken. They then offer example messages that follow these guidelines for a variety of hazard types. The Sutton and Kuligowski (2019) paper). Alerts and Warnings on Short Messaging Channels: Guidance from an Expert Panel Process, is a resource with these examples.

Ideally, disaster-affected communities would immediately respond to warnings and calls for action from emergency response organizations, but this is not always the case. People often engage in milling behaviors when a disaster event affects them (Wood et al., 2018), in which they seek information from multiple sources to try to understand what is happening before they act. If residents are unable to quickly obtain the information that they need, this can delay how quickly they act and respond, which could be catastrophic in a wildfire, flood, dam failure or other type of disaster evacuation. There is some evidence that this milling behavior has caused increasing delay in response times in recent years, due to the wide range of communication platforms (e.g., social media) and sources of information available today (LaLone et al., 2021; Tapia et al., 2018). It is important for emergency management organizations to provide timely and accurate information that helps members of their community to better understand how they should respond to a disaster event and move toward action, rather than milling and seeking more information (Wood, et al., 2018).

3.4.4. Receiver Characteristics and Perceptions

There are numerous studies on whether a person's race, gender, or socioeconomic status affects the propensity to comply with protective measures (Cahyanto & Pennington-Gray, 2015; Edgeley & Paveglio, 2019; McLennan et al., 2019; Thompson et al., 2017; Vásquez et al., 2016). This section focuses on the literature that most applies to online media. Several research studies talk about the danger of the digital divide, and assuming that all members of a disaster-affected community have access to technology and online tools like social media (Crutcher & Zook, 2009; Madianou, 2015). Madianou (2015) specifically warns that digital inequalities can create and further social inequality. In a study of Twitter messages sent by formal emergency responders (Majid & Spiro, 2016), researchers found a lack of support for cross-language messaging, despite evidence that the impacted communities had significant numbers of non-English speaking residents. Emergency managers need to understand the populations whom they serve and provide online communications that are accessible to all. Inequality in online messaging is an important problem that has received little attention in the research literature to date. More studies on this topic are needed.

How people respond to disaster messaging also depends on whether they are familiar with the disaster type or have had past experiences with it (Demuth et al., 2016; McLennan et al., 2019). In many cases, people were more likely to evacuate when they perceived higher risk (Stein et al., 2013; Wallace et al., 2016) or when the risk was personalized—e.g., their home or family is at risk (Huang et al., 2012). Several studies found that having a past experience with a disaster made a person more likely to follow protective measures (Rickard et al., 2017; Taaffe et al., 2013; Trumbo et al., 2014). However, Tinsley and colleagues (2012) found that if people had experienced a near-miss event (an event that could have had significant impact but for some reason did not), they are more likely to engage in riskier behavior when the next event of that type occurs. In one study, high levels of confidence in a local government's ability to manage a disaster, paired with exposure to more disaster preparedness resources, resulted in a higher level of perceived preparedness among the public (Basolo et al., 2009). If people are more knowledgeable about a disaster threat and the actions that they need to take, then officials will not need to convey as much information in their crisis communications (Lindell, 2018).

Responses to a disaster also rely heavily on whether a person interprets messaging correctly. Much literature looks at whether people can accurately detect the danger that is present from news reports and official warning messages (Bica et al., 2019; Bostrom et al., 2018; Casteel, 2016, 2018; Jon et al., 2019; Schumann et al., 2018). One study found that only 26.3% of study participants could correctly explain a tornado warning polygon (Mason & Senkbeil, 2014). When sharing information through channels like social media, it is important that the messaging is clear and easily understood by the intended audience (Bean et al., 2016).

IV. METHODOLOGY

The researchers have used mixed methods to obtain and analyze the information in this report. The team conducted Extensive reviews of academic and professional literature, followed by interviews with subject matter experts in the fields of community alerting and warning, fire behavior, social media use in disasters and the technology of social media management. Public agency leaders were interviewed solely to clarify facts collected from other sources, and to provide details about response procedures not found in available documents.

The two research questions posed were:

- What is the current state of the practice used by public agencies to communicate disaster information to the public, build trust and compel action? Using the SCU and CZU fires as examples, what current practices worked well, which need to change to create community trust and action, and which need to stop?
- 2. How can disaster reports from traditional and social media be organized and disseminated in near real time to support geo-specific, accurate and timely emergency public information?

The answer to the first question is developed through the analytical approach of program evaluation. A program evaluation often examines the problem that was being addressed, the solution that was tried, the implementation of the solution and then evaluates the success of the solution (Sylvia and Sylvia, 2012). The identified problem was delivering timely, actionable and effectively received emergency management messaging during the SCU and CZU complex fires in the summer of 2020 to a diverse community. The solution was the use of IPAWS and WEA in both events, bolstered by a new and untested Zonehaven technology in the CZU fire. Social media resources were also used for emergency messaging by both official sources and the general community.

Summaries of factual information about the SCU and CZU fires included in the Findings. The implementation of the traditional and social media approaches occurred during the critical first days of each event, when life safety was the focus of messaging, while also trying to limit the impact of the messaging on unaffected members of the community. The Findings section reports on the successes and failures of emergency messaging in each fire, and then on social media and emergency communications.

The evaluation of the effectiveness of the implementation is conducted in the Analysis section of this report. Lessons for best practices for emergency public information dissemination were gleaned from the research on the CZU and SCU fires, the social science literature, and the subject matter experts who were interviewed. The first section describes action that can be used by both traditional and new channels of public information before an emergency event. Traditional media are typically one-way communication methods, while social media are two-way. The second section focuses on best practices that would build trust through online communications, such as websites and social media, during an emergency event, when both official sources and community members are contributing to the pool of disaster-related information.

The answer to the second question is by its nature more speculative, but some insights to current technology are provided in the discussion of Question 1, and a path forward is considered in the white paper attached to this report.

This project has been excluded from review by the San Jose State University Institutional Review Board because there are no human subjects used for this research.

V. FINDINGS

5.1 PUBLIC MESSAGING IN THE CZU FIRE IN SANTA CRUZ COUNTY, CALIFORNIA

5.1.1. CZU Fire Facts

The CZU Complex fire burned from August 16 through December 23, 2020 in an area that included private property and federal lands (Cal Fire, 2021a). It impacted parts of San Mateo and Santa Cruz counties. The fire continued to spread for 37 days, consuming 86,509 acres (Cal Fire 2022c), of which 63,754 acres were in Santa Cruz County (Santa Cruz County Civil Grand Jury, 2021). After containment, the fire burned for more than four months, with 1,490 structures destroyed (Cal Fire, 2021a), 1,000 within Santa Cruz County (Moench, 2020), 140 structures damaged, and one civilian death, becoming the largest fire in CalFire CZU unit history (Cal Fire, 2021a). Unified command was formed with two sheriff's departments and five fire protection agencies joining Cal Fire (Cal Fire, 2022). CalFire CZU provided daily updates at 6:00 am on the radio (Chris Thompson, personal communication, April 28, 2021). Public information was managed by the unified command. On August 22, 2020 a Presidential Declaration of Major Disaster #4558 was granted by FEMA for San Mateo, Santa Cruz and five other counties, including individual assistance and hazardous materials removal for residents of fire zones (FEMA, 2020).

5.1.2. Evacuation Management

The CZU fire was one of the lightning-caused fires burning simultaneously in the state in August 2020. It was Santa Cruz County's biggest fire in 100 years, and "the level of escalation was surprising" even to a local fire chief (Chief Stacee Brownlee, personal communication, March 7, 2022). Much of the area that caught fire had no history of wildfire activity, so residents were not prepared for the need to evacuate, and communities often have few resources for fighting unanticipated wildfires.

Boulder Creek had its first spot fire on Monday, and the chief called Cal Fire and started the evacuation. That night Boulder Creek was evacuated, then Ben Lomond, which was evacuated by the sheriff. Bonnie Doon was "wiped out" (Chief Stacee Brownlee, personal communication, March 7,2022). Lack of available fire personnel and equipment meant that the fires burning in inaccessible terrain with no fire history were allowed to burn (Cal Fire, 2021a). Lacking fire breaks, wildfire fighting equipment and evacuation experience, the communities had relied on Cal Fire for response if it became necessary, but they were out of resources.

The fires started in San Mateo County and burned south into Santa Cruz County, with most of the fire burning in State Responsibility Area (SRA) land where Cal Fire was in charge. As the fire reached Big Basin State Park, evacuation orders were issued for the park, Boulder Creek, Bonny Doon and Las Cumbres. Wind and terrain allowed the fire to spread rapidly to 43,000 acres overnight on August 18, 2020, resulting in additional evacuation orders for South Skyline, Russian Ridge, Middleton Tract, and Portola Redwoods, then communities along Empire Grade and the San Lorenzo Valley were added. Felton, Davenport and

Santa Cruz were also threatened, and the fire burned along the Ben Lomond mountains toward University of California at Santa Cruz campus, causing it to be evacuated (Choi, 2020). "The fire burned to Highway 1 on the western flank, Pescadero Creek road on the north flank, Highway 9 on the east flank and Bonny Doon/Smith Grade Road area on the south flank" (Cal Fire, 2021a, p. 56). Scotts Valley was also evacuated (Kelliher, Baron and Kendall, 2020).

The Ben Lomond Fire Department asked for an engine strike team to help fight the fire in Bonnie Doon, but Cal Fire estimated that they did not have the resources to fight the fire. About 50 of the residents organized themselves to stay and defend their town. Living in the wildland interface, residents had prepared for a wildfire, obtaining water tanks and hydrants, and they created their own fire department. They used Google Docs and weather reports to plan their strategy and kept aware of exit routes. Observers noted that they had chainsaws, bulldozers and scouts on motor bikes to guide the creation of fire lines. By Sunday afternoon, nearly a week after the residents chose to stay and defend, professional fire department strike teams arrived, and helicopters began water drops. Fire Chief Stacee Brownlee of the Ben Lomond Fire Department noted that the help arrived after news reports of the absence of Cal Fire from the area (personal communication, March 7, 2022). Residents who had evacuated created supply lines to support the defenders. CalFire PIO Dan Potter noted that they lacked hand crews because the number of prison inmate firefighters had dropped due to the COVID-19 early release program for low-level offenders (Wigglesworth and Rust, 2020).

An evacuation center was created in Half Moon Bay where evacuees could get information and a meal. Food was donated by a local market that had to evacuate and gave away their perishable items to feed fire fighters and evacuees. Residents of low-income communities in San Mateo County, like La Honda, Pescadero and small unincorporated areas, were evacuated but had few resources to pay for lodging, after suffering low employment during the COVID-19 pandemic. Residents drove around the fire zone trying to decide whether to evacuate, hindering the movement of fire vehicles (Kelliher, et al., 2020).

Firefighters and Silicon Valley technology experts joined together in 2018 to create a better evacuation planning tool to cope with the size and frequency of California's burgeoning wildfires. By early 2020 the Zonehaven team had a three-year contract with San Mateo County and a two-year contract with Santa Cruz County to create evacuation maps and plans that could provide precise, address-based guidance to residents on whether to evacuate and what route to use. The software was designed to estimate traffic back-ups and design the best routes away from danger.

When the CZU fire started, the Zonehaven program was still six weeks away from its planned launch. A local fire chief asked the creators to launch the program, and in 20 minutes they were feeding field reports into the algorithm to create evacuation zones based on threats determined by weather and terrain. Evacuation notices were sent "through Facebook, Twitter and emergency text alerts," directing residents to an online map of the safe routes. After the success of Zonehaven in the 2020 fire evacuation management, Waze has agreed to include evacuation notices on its system (Ryan, 2021, n.p.). Nearly 80,000 people were safely evacuated using the system, although one person died when fire blocked his route (Larson, 2020).

While San Mateo County lost 490 homes and had one death, Santa Cruz County lost 925 homes and 3 multi-family residences, but had no loss of life. More than 60,000 people evacuated for at least part of the event, with 1,800 staying in shelters. The county assisted evacuees with free hotel rooms in 187 hotels paid by FEMA and 400 rooms offered for free by AirBNB hosts, but permanent shelter was a larger challenge, as much of the affordable housing stock had been lost to the fire. The FEMA hotel program only lasts for 30 days after the end of the disaster declaration (Moench, 2020).

Before the fire, Santa Cruz was the 7th least affordable housing market in the United States, with 2,000 homeless residents. Help was being provided for 4,800 evacuees, and the rental market was eased somewhat by the lack of UC Santa Cruz students, who were all on distance learning programs due to COVID-19. Once the hazardous materials were removed from the burned homes, residents were able to get permits to stay on their lots in trailers, provided they had electricity, running water and a septic system (Moench, 2020).

5.1.3. Evacuation Messaging Challenges

Cal Fire used its Twitter feed to update the public on CZU Fire progress, and San Mateo County had a wildfire resource page. SMC Alerts pushed information to residents who had signed up using IPAWS and WEA systems. San Mateo County used Facebook and Twitter to reach community members with updated fire information and held Zoom meetings regarding fire response and resources that included Spanish language translation. As the assistance centers at Half Moon Bay and Pescadero closed, a new recovery page was created on the county's website to provide sheltering information (San Mateo, 2020).

In 2021 the Santa Cruz County Civil Grand Jury issued a report that criticized the county government's response to the CZU Fire. A principal complaint was the lack of coordinated communication from the elected officials to the community (Johnson, 2021). CalFire held a public information briefing each morning at 6 am on the radio, with chief officers from the small fire departments participating. The briefings followed the same format of a weather report, current fire conditions, and updates on community impacts (Chief Stacee Brownlee, personal communication, March 7, 2022). Many of the smaller mountain towns complained of a lack of updated communication from the Cal Fire sources, noting the inability to see a map of the fire. Unfortunately, they lost cell towers early in the event, so they often could not get information from IPAWS and WEA sources. They lost power and internet lines, so they could not access social media or electronic media sources (Stadiewicz, 2021), or ZoneHaven, which is web-based. Residents with NOAA weather radio or battery-operated radios were able to access the daily calls, but the dynamic nature of wildfires meant that a daily briefing was quickly out of date.

During the CZU fire one neighborhood created a communication system by climbing to a high point on the mountain and accessing a cell phone connection from outside of the fire zone to collect social media information from a friend in the unaffected area (Stadiewicz, 2021). This example inspired other neighborhoods to prepare better communications systems for future emergencies. Communities are developing their own Multi-Use Radio System (MURS) and amateur radio networks to ensure that they can access outside information (Chief Stacee Brownlee, personal communication, March 7, 2022), and some are requesting the reinstatement of the civil defense siren systems to warn of fires.

Cal Fire public information officers (PIOs) were operating out of the Incident Command Post (ICP) in Scott's Valley, using an inaccurate map of the fire zone that confused residents. Local fire departments, many of which are all volunteer, were focused on trying to defend homes, provide medical aid and assist with vehicle accidents during the fire. Some local fire departments participated in the ICP briefings but did not have formal PIO training. However, because they were residents of the area, they were o ften able to provide map corrections. They also recognized the need for better reporting on future events, emphasizing effective wording and accurate mapping. However, by its nature wildfire is volatile and dynamic, making it hard to maintain accurate situational awareness and common operating picture – a uniform view of the fire fight. Cal Fire had challenges keeping up with the changing fire conditions in the mountainous areas, many with very limited access. Zonehaven has the potential to give people access to better evacuation maps, but elderly residents of the mountain towns are often unfamiliar with computers and may need help to use the system (Chief Stacee Brownlee, personal communication, March 7, 2022).

Social media postings during the CZU fire from bystanders also created confusion, often providing misinformation about where the fire was burning. Google maps routing was sometimes inaccurate, including routes that went off a cliff. To try to manage this information problem, local fire departments assigned an officer to monitor the posts and provide immediate corrections and answers to queries from the community. They recognized the value of Community Emergency Response Teams whose members could assist their neighbors with obtaining better information, freeing trained fire personnel to focus on emergency response needs. During the CZU fire many neighbors formed their own self-help networks for information sharing and communication. In Bonny Doon, neighbors created a MURS radio system (Chief Stacee Brownlee, personal communication, 2022, 2021), while in Boulder Creek neighbors have organized to deal with a post-fire drinking water delivery crisis. The fire destroyed Boulder Creek's surface water treatment plant, and fire-retardant chemicals are believed to have gotten into the drinking water system (Hagemann, 2021), leaving them to rely on bottled water until another agency buys the water delivery system.

5.2 PUBLIC MESSAGING IN THE SCU FIRE IN SAN JOSE, CALIFORNIA

5.2.1. SCU Fire Facts

The SCU Complex fire burned from August 18 through October 1, 2020. It impacted parts of five counties: Santa Clara, Alameda, Contra Costa, San Joaquin, Stanislaus (Cal Fire, 2022, Freedman, 2020, Wilcox & Harkness, 2020) and Merced counties (Reed, 2021). The fire burned 396,624 acres (Cal Fire 2022), becoming the third largest fire in California history up to that time (Cal Fire, 2021a, p. 37). A fire progression map is available at https://ftp.wildfire.gov/public/incident_specific_data/calif_n/!CALFIRE/2020_Incidents/CA-SCU-005740_SCU_Lightning_Complex/GIS/Products/20200907/progression_e_port_20200906_2101_SCULightningComplex_CASCU005740_opt.pdf. The fire burned for 44 days, with 222 structures destroyed, 26 damaged, six confirmed injuries, but no deaths (Cal Fire, 2022). More than fifty city, county, special district, and state agencies participated in the response, both in the field and in emergency operations centers (Cal Fire, 2022). CalFire SCU provided daily updates at 3:00 pm on their Twitter account (San Jose, 2020b).

The public information function was consolidated at the Joint Information Center (JIC) at the Alameda County Fairgrounds, where the incident command post was located. Dana Reed, county Office of Emergency Services director, was the county/Operational Area's representative at the JIC (personal communication, Ray Riordan, July 2, 2021). Cal Fire's personnel developed the evacuation maps for the SCU event based on their estimates of fire behavior in the three zones: the Canyon Zone in Alameda, Santa Clara and parts of Stanislaus counties; the Deer Zone in Contra Costa; and the Calaveras Zone in parts of Stanislaus, San Joaquin and Merced counties (Reed, 2021, Broomfield, 2020).

5.2.2. Evacuation Management

Maps

Because of the fire's size and wind conditions, the fire spread was dynamic, and CalFire developed initial evacuation warning maps based on early estimates of fire behavior. These maps were shared with County of Santa Clara and the City of San Jose emergency operations center staff, who early on recognized that a more detailed approach was needed. The JIC also posted the maps to various social media accounts (Lee Wilcox, personal communication, November 8, 2021).

The early Cal Fire maps used the boundary line between the city and the county to define the evacuation zone, but that line is drawn in the mountains with very jagged lines. Also, many residents are unaware whether they live in the city or in county unincorporated areas adjacent to the city with a San Jose mailing address. Thus, the maps created confusion among residents regarding whether they should evacuate. To further exacerbate the problem, the Santa Cara County Sheriff's Office deputies provided door-to-door notice to county residents to evacuate, based on the Cal Fire maps, while City of San Jose residents on the other side of the same street received no notification regarding evacuation, because it was not needed (Ray Riordan, personal communication, July 19, 2021).

San Jose Fire Chief Robert Sapien was in the San Jose emergency operations center (EOC) when the early Cal Fire maps arrived. A careful evaluation of the maps and the actual weather conditions led him to believe that errors had been made in drawing the evacuation zones. He collaborated with the city's geographic information system (GIS) map makers to create a more accurate map for the city areas threatened by fire, which showed that no evacuation was needed based on current conditions. The fire department staff held a liaison meeting online for rural residents and Cal Fire, displaying the updated San Jose map. Cal Fire adopted the updated map (Ray Riordan, personal communication, July 2, 2021). The next day San Jose shared its GIS with Cal Fire to enable better cooperation, and Cal Fire mapped the status of the fire, and the San Jose EOC mapped shelter information (fire official, personal communication, July 3, 2021). By August 21, San Jose had its own detailed map for evacuation for its residents (del Castillo, 2020).

By August 25, 4,000 people in Santa Clara County has been evacuated, none in the City of San Jose (Wilcox & Harkness, 2020).

AlertSCC

Santa Clara County uses AlertSCC to notify the community of disaster information and used the early Cal Fire maps to create the distribution plan for the warning messages. This resulted in over-notification of community members about the need for evacuation. WEA messaging is at the mercy of cell tower location. The message is programmed to be broadcast to cell phones using specified cell towers, which may cover an area larger than the intended notification zone. This resulted in people in San Jose and Gilroy getting evacuation messages that were intended for county unincorporated area residents (Ray Riordan, personal communication, July 2, 2021).

Santa Clara County's AlertSCC was only broadcast in English, even though multiple languages are spoken in the county. Written materials on the county Office of Emergency Services' website included Spanish, Vietnamese, Tagalog and Chinese versions of guidance documents, but the cell phone broadcasts were English-only, which left many community members without evacuation information (NGO official, personal communication, December 23, 2021).

City of San Jose councilmembers were impacted by over-notification of their residents. Three council districts along the eastern side of the city were impacted: districts 4, 5 and 8. Residents expressed concern to city officials that there were gaps in communication, incorrect areas were notified, and the content of messaging was confusing (Ray Riordan, personal communication, July 2,2021.) However, one councilmember was in a contentious re-election race, and re-Tweeted the early evacuation map on the office's Twitter account (Lee Wilcox, personal communication, November 8, 2021). Unfortunately, the elected official refused to take the original Cal Fire map down from the Twitter account once the updated map was provided. People in the district who knew the councilmember were influenced by the post, continuing the confusion in one of the community's ethnic groups (Anonymous public official, personal communication, 2021).

Social Media Challenges

Residents of the county unincorporated area had to continue to rely on Cal Fire for guidance. They reported that they were relying on Twitter rather than on the county's official notifications. The patchwork of evacuation orders on the side of the mountain made for confusion. Cal Fire posted a live evacuation map to Twitter, but the twisting road segments made it hard for residents to understand when they needed to go. One even tweeted to San Jose Mayor Liccardo for direction. Lan Diep, the District 4 councilmember, used Twitter to clarify directions for his constituents, calling the AlertSCC texts "not precise." Many residents decided to leave before dark as a precaution (del Castillo, 2020).

On August 21, 2020, Flash Report #1 was posted to the city's website under Emergency Notifications. The San Jose Status box stated that there were no fire evacuations required within the city, but acknowledged that along the eastern border of the city there were evacuation areas "established for the unincorporated areas, which may result in neighbors receiving differing instructions" (City of San Jose, 2020a). A link to the current fire evacuation map was provided. Residents could select one of 11 different languages, and 2 versions of

Chinese to read the Flash Report. On August 26, 2020, Flash Report #2, with the same language capabilities, reported 25% containment of the fire, and no evacuations for San Jose (San Jose, 2020b).

No Shelters Were Opened in Santa Clara County

Because so few people were expected to need to evacuate, the county opened evacuation information centers rather than shelters in Milpitas, Morgan Hill and Cupertino. Homeowners generally have homeowners' insurance that includes coverage for alternative housing expenses. Renters often have no insurance, and most renter's insurance does not include alternative housing expenses. Thus, homeowners could generally afford to follow evacuation warnings and leave, while many renters could not, making the decision to stay or go very stressful. This was exacerbated by the presence of the COVID-19 employment limitations, which negatively impacted the incomes of many households.

Active firefighting continued to the east of San Jose outside of the city limits. By August 23 there was evidence of burned chaparral east of the Smith Creek Fire Station, and previous fire activity near the Mount Hamilton Observatory, but no fire within any San Jose city limits (Robert Herrera, personal communication, February 2, 2022).

5.2.3. Some Solutions to Evacuation Messaging Challenges

Many of the residents of the Bay Area, including Santa Clara County and the City of San Jose, are mono-lingual non-English speakers, so communicating accurate information about the fire required additional resources focused on human interaction. Since 1981 the City of San Jose has had a bilingual pay program to recognize the value of having staff who can provide both verbal and written culturally competent translations. Employees' language capability is tested by an outside vendor. When employees are appointed to jobs with the need for bilingual services, they are paid a premium pay based on the bargaining unit's agreement (Garza, 2013).

On August 21 a San Jose Fire captain with public information officer (PIO) training was deployed to the incident command at the Alameda County Fairgrounds to serve as a bilingual English/Spanish PIO (Wilcox & Harkness, 2020). Another bilingual San Jose Fire Captain with PIO training was sent to the base of Alum Rock Park on the eastside of San Jose with a sandwich board and an evacuation map. He was able to speak with community members in Spanish in a culturally competent context. A third San Jose Fire Captain went to a strip mall near The Villages, a very large senior adult community in the Diablo Range foothills, within San Jose. He was placed in a readily accessible, high visibility location to provide information and updates to the community (Erica Ray, personal communication, February 2, 2022).

The San Jose EOC distributed its materials by multiple means in English, Spanish, Vietnamese, and other relevant languages, based on the neighborhood of focus. Translation vendors are used for any of the needed languages, but bilingual city staff and volunteers read the translations to ensure cultural competency. The San Jose Fire Department used social media to distribute video information and collaborated with English and Spanish language electronic media to keep the community updated on fire movement and evacuation

information, based on information from San Jose Fire Battalion Chiefs who served as field observers for fire behavior. Chief Sapien and Mayor Liccardo used Facebook to provide updates to the community (Erica Ray, personal communication, February 2, 2022).

The complexity of language services is demonstrated by the districts' ethnic representation in Table 5. While most of the Hispanic population would most likely speak Egnlish or Spanish, the Asian population represents Cambodian, Chinese, Hmong, Japanese, Korean, Lao, Tagalog and Vietnamese speakers, as well as people from south Asia who speak languages and dialects of the Indian subcontinent. The Black population of San Jose primarily speaks English, but there is also a large Ethiopian population with monolingual non-English speakers. Among the White population there are various languages spoken, such as French, Portuguese, Italian, Russian, Ukrainian, Turkish, Farsi and Arabic, and perhaps others. This makes language competency essential, recognizing that emergency management materials must be not only in the correct language, but also culturally competent. Therefore, instructional materials in the relevant community languages must be developed before an emergency and maintained in electronic formats for rapid posting to social media, sharing with traditional media, or to use as scripts for broadcasts and livestreams.

Ethnicity	District 4	District 5	District 8
African American/ Black	2,846	2,444	2,691
Asian	61,364	24,514	51,911
Hispanic	16,852	56,196	24,774
White only	15,964	6,393	15,709
All Other	2,843	1,316	2,251
Total Population	99,869	90, 863	97,336
Owner Occupied Housing Units	61.4%	52.1	81.2
Renter Occupied Housing Units	38.6%	47.9	18.8

Table 5. East Side Council Districts' Ethnicity

Source: San Jose, 2010.

By August 23 when the remnants of Hurricane Genevieve blew into the Bay Area, threatening additional lightning and wind, Cal Fire and San Jose's cooperation led to very detailed descriptions when evacuations on the east side of the city were needed, in the Alum Rock, Berryessa and Evergreen areas of San Jose, and for parts of Morgan Hill. Santa Clara County and the American Red Cross opened evacuation information centers in Milpitas, Morgan Hill and Cupertino. San Jose Mayor Sam Liccardo negotiated reduced room rates at 13 hotels in the city for a program called San Jose Cares to accommodate evacuees.

Updated information was shared with residents on a Twitter livestream broadcast with Mayor Liccardo, Chief Sapien and Assistant City Manager Lee Wilcox (KPIX 5, 2020). Chief Sapien assured the listeners, "We will be using multiple means if necessary to notify, whether that's through digital devices or manual knocking on doors or audible devices as well" for those needing to evacuate (Silicon Valley Newsroom, 2020, n.p.). In addition to Twitter, the Mayor's Office used the Nextdoor social media site (Liccardo, 2020).

The EOC public information function provided regular social media feeds. They also provided support for Mayor Liccardo's Facebook Live and for councilmembers' videos and updates. Critical messaging included not only evacuation information, but also information on dealing with the unhealthy smoky atmosphere. Regardless of the lack of evacuation orders, the EOC PIO staff created materials in case of need: drafted evacuation notices, developed evacuation resource web page (quadrilingual), developed social media posts (quadrilingual), and produced a flyer (quadrilingual) to distribute door-to-door. They also produced wildfire informational materials: digital and traditional flyers, ethnic media outreach; developed wildfire emergency notification webpage (quadrilingual); generated Flash Reports (quadrilingual); posted messages on Twitter (quadrilingual) and Facebook; and distributed flyers at San Jose, but be prepared. Some Tweets containing this message were in five languages (Wilcox & Harkness, 2020).

By August 26, 2020, Mayor Liccardo used Nextdoor to assure the community that the threat from the fire is "currently minimal," and that evacuation areas in Santa Clara County had been reduced to warning zones. The fire burned on for more than a month before being declared contained on October 1 (Cal Fire, 2022).

Unfortunately, not all of the elected officials were willing to follow the state's guidance on having the organization "speak with one voice." Under the Standardized Emergency Management System (California Government Code 8607), all messaging is supposed to be created and coordinated through the EOC, so that one consistent message is given by all city leaders. The EOC in turn coordinates with the Incident Command in the field to ensure consistency in public messaging (Edwards, 2002). The PIO monitored the social media messaging to ensure that inaccuracies were quickly corrected. During the fire, there were councilmembers who independently re-Tweeted Cal Fire messages that had not been vetted for accuracy when applied to San Jose specifically, rather than to the other county areas. This led to confusion and was unhelpful (Lee Wilcox, personal communication, November 8, 2021).

5.3. SOCIAL MEDIA AND EMERGENCY COMMUNICATIONS

Data Scraping

As discussed in Section 2.3, one way in which public organizations can help supplement intelligence gathering in conjunction with traditional methods is to use data scraping, as well as crisis mapping tools, if they are not doing so already. Many data scraping tools are commercially available to public and private agencies alike. A standard tool used by tech industry leaders is Dataminr. Dataminr is an algorithmic data-scarping tool used by hundreds of large companies worldwide for various intelligence-gathering purposes (Dataminr website, 2022, np). Dataminr uses machine learning technologies to vet inaccurate or irrelevant information on social media platforms. One significant benefit to Dataminr is how it integrates with crisis mapping systems.

For this reason, many industry leaders in the private technology sector use Everbridge technologies and its associated Virtual Command Center, commonly referred to as VCC (Tech Industry Security Department Management, personal communication, January 16, 2022). Everbridge is a commercially available product that allows organizations to send

mass notifications to stakeholders. Different email groups can be created and tailored to an organization. That way, the appropriate stakeholders are notified about a given incident (Everbridge website, 2022, np). The Virtual Command Center, an Everbridge product, acts as an integrated crisis mapping technology that draws information from data scraping technologies (Everbridge website, 2022, np). Information automatically populates into VCC from Dataminr and other commercially available sources, which is helpful for the early detection of an incident (Everbridge website, 2022, np). Information can also be edited and manually placed into VCC by the user (Everbridge website, 2022, np). The newly inputted information is automatically sent to an Everbridge notification template, which can quickly be edited, reviewed, and sent out to stakeholders (Everbridge website, 2022, np).

Other commercially available data scraping tools include TweetTracker, which Arizona State University first developed in 2011. TweetTracker acts as a visual analytics tool explicitly made for disaster relief purposes (Landwehr, 2016). TweetTracker monitors and extracts locations, as well as keywords from online sources (Landwehr, 2016). TweetTracker compares those same tweets with real-time trending information, historical data, and data scraping tools (Landwehr, 2016). TweetTracker includes filters that allow researchers and emergency managers to focus on tweets of interest and examine retweet graphs and heat maps (Landwehr, 2016). TweetTracker was first used by the organization known as Humanitarian Road during Hurricane Sandy, in 2012.

Crisis Mapping

Other commercially available crisis mapping platforms available to public organizations include Ushahidi, Mapbox, CrisMap, Google Crisis Map, SensePlace2, ESRI, ArcGIS, and Criscomms (Avvenuti, 2018). These systems allow public members to upload information in a participatory way and draw from information from social media. Crisis mapping has the potential to benefit all stakeholders that are involved in disaster response, including the public and emergency managers. Programs such as CrisMap extract potential crisis-related information from Twitter and classify the tweet based on word embedding and geoparsing. The selected tweets are then placed on a web-based dashboard to be visualized (Avvenuti, 2018).

These mapped visualizations can help estimate the impact of a disaster in all phases of response. Crisis maps can help emergency managers determine which geographic locations are most impacted by a disaster and can help emergency managers in decisionmaking. Crisis mapping can also be used as a tool for the public by providing up-to-date information in real-time. Not only do crisis mapping tools allow text to be visualized, but they also allow for real-time location, video, and photos to be shared. An additional such tool for emergency managers would be the commercially available product known as Intrepid Response Situational Awareness Platform. This application is a relatively lowcost product that is designed much like other crisis mapping systems, with a focus on situational awareness (Intrepid Response website, 2022, np). Intrepid Response is a mobile application available on both Apple and Android products.

Video Applications

An important note is that for public organizations to effectively use social media for the purpose of situational awareness, they must be aware of what applications are popular, and offer value to the community members. One online resource that presents an opportunity for public organizations, that private organizations are currently using, would be the live video streaming service known as Periscope. Periscope, a service developed by Twitter, offers several benefits to intelligence analysts (Baron. 2015). Periscope users can post video feeds through the Periscope application or Twitter. In addition, videos can be made private or public by the user. Watching and reviewing live video coverage from an individual present at an incident offers several advantages. Members of public organizations can also use Periscope to communicate with the public, provide live updates, and convey important information (Baron, 2015). Another benefit of monitoring live video streams through Periscope and other services is that the information provided tends to be more accurate and detailed than the traditional text analysis of a standard Twitter post (Baron, 2015). Since video streaming occurs at a smaller scale than standard tweets, the quantity and velocity in which analysts can review the message is reduced (Baron, 2015). Additionally, live video streaming also benefits from knowing who the individual is who is reporting from a given event.

Blogs

Another social media platform that offers advantages to public organizations that leaders in the technology industry are currently using is the blog forum website Reddit (Tech Industry Security Department Management, personal communication, January 16, 2022). Although Reddit does not provide as immediate real-time information as Twitter or Periscope, Reddit is valuable to prevent potential incidents from occurring. Reddit does not designate any character restrictions, and groups or individuals often use it to plan potential incidents. Public organizations can use data mining technologies to detect keywords and phrases in Reddit to identify any potential future incidents (Tech Industry Security Department Management, personal communication, January 16, 2022). Intelligence Analysts working for private companies will often discover information on Twitter that could potentially affect the public. This information is escalated and brought to the attention of public organizations. Reddit also benefits from identifying members who participate in various communities or groups that may interest public organizations (Tech Industry Security Department Management, personal communication, January 16, 2022).

Twitter

Many industry-leading technology companies emphasize using Twitter for intelligence gathering purposes. Twitter is a valuable resource to public organizations for a host of reasons. Twitter is one of the largest, most frequently used platforms, and most information is openly available to the public (Tech Industry Security Department Management, personal communication, January 16, 2022). Twitter also tends to attract users from various demographics and allows for location listing. Another benefit of Twitter is that it provides specific geographic and word-based filters when searching and conducting open-source intelligence gathering. In addition, Twitter enables intelligence analysts to search using hashtags. These factors often lead to information going viral on Twitter and allow for

the quickest information dissemination compared to other major social media platforms. Twitter is the most effective social media platform for data scraping large amounts of information, and verifying information gathered from data scraping (Tech Industry Security Department Management, personal communication, January 16, 2022). For these reasons, public organizations that are using social media as an intelligence gathering, as well as a communication, tool, should use Twitter.

Although platforms such as Instagram and Facebook are useful data scraping and intelligence gathering sources, they are not as effective as Twitter, especially as applied to rapidly changing events. Facebook and Instagram are less effective than Twitter because most profiles on both platforms are private. Privacy restrictions on Facebook and Instagram mean that data scraping programs have less information to draw from, and Intelligence Analysts have fewer resources to verify the information (Tech Industry Security Department Management, personal communication, January 16, 2022). One practical use for public organizations regarding Facebook is to communicate information using live video streaming.

Nextdoor

The platform Nextdoor is a valuable tool because there is a higher likelihood of accurate data than Twitter. Users on Nextdoor tend to post information in and for their local neighborhood or community. If multiple individuals on Nextdoor post about a possible incident, it is likely because they are in or near the geographic location in which the incident is occurring. The main drawback to Nextdoor is that its user base is relatively small, so data mining systems do not have a large pool of data to use (Tech Industry Security Department Management, personal communication, January 16, 2022). Many posts on Nextdoor tend to be speculative and do not paint an accurate picture of an incident. For these reasons, Facebook and Instagram should be used by public organizations as a means of communicating with the public, especially through live video streaming. Public organizations should use Nextdoor to collect intelligence and help verify information, especially when it comes to early event detection.

VI. ANALYSIS

Best Practices for Emergency Communication to Build Trust with the Community

6.1 ACTIONS TO TAKE BEFORE EMERGENCIES

Knowing the potential hazards in a community is the first step in emergency planning. Risk assessment is one tool for developing appropriate public education and outreach to the community.

6.1.1. Risk Assessment Tools

Community members often question whether they will get significant return on investment for money spent on hazard preparation and mitigation, such as replacing a shake roof with a fire resistant one before it has reached the end of its useful life. Many also question whether re-landscaping their property with fire resistant material, and especially the loss of big trees close to the house, is justified based on the real risk of wildfire at their home. Community outreach events offer an opportunity to introduce the public to tools that are available to help them determine the wildfire risk to their properties. One such tool is First Street Foundation's Risk Factor tool. It started in 2020 as a flood risk assessment project but has added Fire Factor for wildfire to its hazards (Graff, 2022).

Unlike state and federal risk analysis data, which evaluate large areas for wildfire risk, Risk Factor creates an analysis for each individual property address based on 30-meter square pixels. The analysis is based on data from the US Forest Service and the National Oceanic and Atmospheric Administration, and property level data from Assessor's Offices. The tool shows wildfire probability for given a property for 2022 and 2052, showing the impact of climate change on wildfire risk. The thirty-year period is selected as that is the most common length for a mortgage. Risk assessment tools can motivate community members to take mitigation and preparedness actions based on the probabilistic risk scenarios (Graff, 2022).

6.1.2. Pre-Disaster Public Education

Many researchers have emphasized that building trust in government agencies in advance of an emergency will result in more public reliance on government agency messaging during an emergency response (e.g., Mileti & Sorenson, 2018; Esposti, et al., 2021; Palen & Hughes, 2018; Putnam & Garrett, 2020 and many others cited in the Catalog of Social Media and Trust in Government). Some best practices have been discovered in multiple locations, and some have been recommended by government leaders who have been interviewed (e.g., Riordan, 2021; Reed, 2021; Wilcox, 2021; Ray, 2022).

Concise Clear Consistent Continuous repetition Compel action
Common language
Conversation
Coalitions
Community Focus
Cost Effective

Figure 4. Lopes' 10 "C"s for Effective Communication *Source:* Lopes, 2002

Pre-disaster public outreach enables community members to understand media reports about unfolding hazard events, and to appreciate the significance of public agency messaging about protective actions such as evacuation. FEMA provides training and resources for the whole community at its <u>ready.gov</u> site and through the IS-909: Community Preparedness Course (FEMA, 2013). The Community Emergency Response Team (CERT) program is a structured 20-hour program that educates community members to help their neighbors during an emergency, explains the most common hazards in the community, and provides training on pre-event preparedness (FEMA, 2021e). Examples of outreach fliers and a CERT brochure are in Attachment 3. In fire-prone areas, the Fire Safe Council program offers guidance on mitigation steps to protect the home, like creating a cleared space and using fire resistant building materials. It also provides guidance on preparing to evacuate, including what items to include in a "go kit" and how to respond to emergency messaging (Fire Safe Marin, 2017).

Public outreach events can be held in high hazard neighborhoods that explain the perils and give specific direction for engaging in mitigation actions, such as bolting a home to its foundation for earthquakes or installing a fire-resistant roof for wildfires. Such events enable public safety officials to educate the community about their response plans and the actions that they hope community members will take, such as heeding evacuation orders quickly. Explaining fire behavior, that cars fail in heavy smoke conditions, and that cell phones fail due to tower damage from the fire or overload to the system, can help community members anticipate challenges and prepare for them.

6.1.3. Cultural Competency

Cultural competency is critically important in emergency education. To develop appropriate presentations, neighborhood information must be collected in advance. The event organizer should start with demographic information about the community. What ethnicities are represented in the neighborhood? What languages are spoken in the homes, and are any community members monolingual non-English speakers who may need interpretation services during a presentation? Are there children or seniors in the community? If so, their special needs should be addressed.

When a site is selected for a presentation, ensure that there are written materials for every language spoken in that neighborhood. Have bilingual staff present to interact with the public, and if there are no agency staff with appropriate language skills, reach out to religious organizations and NGOs that serve the community to request volunteers to assist with interpretation. Bring interpreters for every presentation session, using simultaneous interpretation when possible.

Community leaders should consider who will make the best messengers for that community. Carolina Camarena, San Jose's public information manager, surveyed the community about their outreach preferences, and learned that the Hispanic members preferred "messaging surrounding the value of family" (Wipf, 2021, n.p.), while the Vietnamese members preferred to hear from a qualified medical professional (Wipf, 2021). San Jose had been working with social media influencers in various communities within the city to spread information about COVID-19 testing access and was able to work with the same social media influencers to spread information about the SCU fire and evacuation messaging (Erica Ray, personal communication, February 2, 2022). Using the appropriate spokesperson can be significant in gaining community cooperation with emergency preparedness. In Lagos, Nigeria, COVID-19 information was most successfully presented by social media influencers, such as sports figures and comedians. African researchers also discovered that using humor, satire and "messaging grounded in influencers' daily lives" was more influential than "dry facts and figures" (Oni & Peter, 2022.n.p.).

Following the Northridge earthquake, many residents of the Los Angeles area, who were originally from Central America, moved out of their undamaged homes and into city parks, living in their cars and makeshift lean-tos. Families with little children preferred to live outdoors during the rainy month of January rather than risk the unlikely structural collapse of their undamaged homes, resulting in many sick children, lack of proper public health and sanitation measures, and general discomfort. At the end of the first week, the National Guard brought in tents and portable sanitation, and the camp was run by the Salvation Army. After a month the City of Los Angeles wanted the tents cleared so the park could be returned to community use. Notices were posted that the tents would be removed, but when the day came not all families were willing to go. Bilingual building officials brought community maps showing locations where the buildings were safe to occupy, but the residents were skeptical. Finally, the city developed Reassurance Teams composed of building officials, social workers and clergy, who visited people in the parks to answer their questions and allay their fears, encouraging them to return to the comfort of their homes. Cultural competence was expressed in including the clergy, since they are highly respected in the Hispanic community, and this led to success in getting people to return to their undamaged homes.

Figure 5. Northridge Earthquake, 1994: Cultural Competency

Source: Edwards-Winslow, 2002

6.1.4. Make A Media Plan

Public information officers should not leave media management to chance. In the midst of a quick onset event there will be stress and distractions. PIOs should create a plan for the public information response to the event that can be easily followed. They should use checklists to simplify execution (see Attachment 4 for examples). PIOs should know the design requirements and limitations for the messaging for each of the messaging outlets— WEA, alert systems, selected social media. Plans should include pre-made messages, a contact list for media personnel (editors, reporters, broadcasters), frequencies for EBS station and local non-English stations, URLs and posting directions for selected social media outlets, and 24-hour contact information for bilingual employees, including home address in case in-person notification is needed. Include the language distribution map for the community.

PIOs should use the checklist for every media event so that it is familiar and update it regularly. Public information staff should participate in all city emergency management training and exercises, and in any other exercises held by local agencies. Practicing with these materials and procedures will lessen stress at the time of a real event.

Emergency management staff should work with other local PIOs to improve the plan. They will benefit from taking available training, such as the courses listed in the attached PIO catalog, and attending conferences to network with other PIOs. All PIO must understand the National Incident Management System (NIMS), the Joint Information System (JIS) and how to establish and work in a Joint Information Center (JIC).

6.1.5. Offer Media Training for Elected Officials

Elected officials often have no training on public speaking and media management. Work with your Office of Emergency Services to offer pre-disaster training for elected and appointed officials, including media relations. Ensure that they understand that all messaging is centralized through the Emergency Operations Center's (EOC's) public information function to ensure a consistent message from the city. Include information about the city's emergency plan, the National Incident Management System, the Joint Information System and the development of a Joint Information Center. Consistency is essential for building community trust and ensuring community safe response to the emergency event.



 Figure 6.
 PIO Training for Elected Officials

 Source:
 Unpublished photo, Dr. Frances Edwards

6.1.6. Be A Trusted Source

Multiple community events engender the need for members of the public to collect reliable information about community circumstances. Weather events, crime, Amber (missing children) and Silver (missing senior citizens) alerts all generate public interest. Public safety agencies and local governments should maintain websites and social media presence so that citizens think of these as the first places for accurate information about developing events. While electronic media will report on an event for 30 seconds to a few minutes, public safety and local government channels can include more detailed data to build community awareness and engender community safety. For example, San Jose Mayor Sam Liccardo regularly uses Facebook Live to discuss issues such as COVID-19 resources. He was a regular communicator during the SCU fire (2020) that was burning to the east of San Jose. (See the Findings section for a more complete description of the event.)

6.1.7. Be A Trusted Source in Many Languages

Many communities are made up of multiple ethnic groups whose members may not

always speak or understand English. In addition, a Brookings study found that 10% of the working age population of American metropolitan areas have limited English competency (Wilson, 2014). Under the stress of an emergency, even bilingual people may find it hard to understand directions and information in a second language. Therefore, public agencies should develop resources to enable the rapid distribution of essential information in multiple languages. One mechanism is to develop a cadre of bilingual employees who can assist the public information officers (PIOs) with translation (into writing) and interpretation (verbal expression) of vital information in multiple community languages. Another is to have contracts with professional translation services who can translate into languages not provided by bilingual employees. However, such professional services must be accompanied by bilingual and culturally competent community volunteers who will review the professional translations for accuracy and cultural acceptability. Often professional services will be using academic vocabulary and usage rather than the normal daily usages of the community. This can lead to offense and misunderstanding, which will engender distrust and suspicion (Edwards. 2012).

A pre-disaster census of community languages, mapped to community neighborhoods or council districts, is an essential tool. This enables the PIOs to determine which languages are needed for events in specific neighborhoods, and get those translations completed and distributed first. This will also guide the PIOs in reaching out to electronic media staff who serve those language communities. As an example, during the SCU Fire in 2020, the City of San Jose issued the Flash Reports about the event in ten languages and both traditional and simplified Chinese. The EOC issued all fire-related information in English, Spanish, Chinese, Vietnamese and Tagalog to meet the needs of the most-impacted areas.

Create pre-made messages for major emergencies in multiple languages that just need the date and time inserted (see examples in Attachment 4). Include the frequency for the local emergency broadcast station (EBS), a well as for the closest media outlet that carries reports in the community's language(s). This enables community members to get quick updates while more detailed messages are being prepared.

6.1.8. Be A Local Authority for Information in Your Domain

Local government departments may develop a following on social media by providing accurate and timely updates on issues that they manage. Public works departments can report on street closures and utility updates while police departments can offer timely information about crimes and related crime prevention advice. Community members will turn to these sources for day-to-day concerns, creating a relationship that steers them to these trusted sources during disasters. For example, Cal Fire's CZU station posts reports of beach conditions from the National Weather Service, as well as updates on controlled burns and brush clearance activities to prevent worry in the community when smoke from these activities comes from the forested areas. Community members are accustomed to accessing information from the CalFire CZU station social media outlets, making it logical to turn to those outlets in times of trouble.



Figure 7. Caltrans Press Conference Source: Unpublished photo, Dr. Frances Edwards

6.1.9. Create a Sense of Community with the Public

Local government posts can include information that encourages a sense of community. Activities like conservation, water management and community betterment can bring together residents for a constructive activity. This may lead to supportive relationships that will carry over through emergencies. For example, a city may use its social media outlets to advertise a creek clean-up day registration opportunity. Community members will know that URL and turn to it when they have concerns about trash in the creek or flooding events. PIOs must be sure that such sites are monitored regularly, and that public queries get timely answers.

6.1.10. Access the Social Media Platforms that Your Community Uses

PIO should monitor a variety of social media outlets to see which are popular with community members. While Facebook and Twitter are nationally known, many community members prefer to use a a social media site with more limited message distribution, such as through Nextdoor, or with posts that have a briefer social media life, as with Instagram. Get accounts on all the social media outlets that are popular with community members and use them for seasonal messaging about safety to get the community used to accessing them. Be sure to

change the message regularly to keep community interest. At the time of disaster, it will be easy to post the new notifications for community action and attract the attention of followers.

6.1.11. Write for the Platform

Different social media platforms have different messaging standards. Some have a character limit for messages. Others rely on video rather than verbiage. Prepare messages for each venue in advance that will need only minor additions for posting during an emergency. Consider whether the platform has pages for different languages and engage bilingual staff to create messaging for non-English outlets. Residents go to a specific platform because it meets their needs, so design your messaging to conform to those expectations.

6.1.12. Use Traditional Media Outlets

Not everyone uses social media. Older people and non-native English speakers are less likely to use social media than younger community members and native English speakers. Develop relationships with local reporters for radio and television stations and newspapers. Encourage them to access public organization PIOs as a source for comments on local stories. Work with them to place stories on community preparedness activities, especially for national events like Fire Prevention Week in October, and statewide events like Earthquake Preparedness Month in April. Invite them to cover activities like FEMA's Community Emergency Response Team (CERT) training and creek clean-up days that involve community members. These relationships will help public agency PIOs to place stories with the traditional media during emergencies.

6.1.13. Involve Community Members in Emergency Preparation Outreach

Reach out to community members who have already prepared for an emergency and ask them to share their preparation with their family, friends and neighbors through their social media sites. Develop a CERT program to train more community members in preparing for emergencies. Offer the training locally and charge just enough to cover the cost of the hardhat and vest that are the identification uniform. Encourage the team members to outreach to their neighbors and organize an emergency response plan. This is especially important in remote areas, mountainous areas, or other places that might be isolated in an emergency.

Community communication during disasters is a critical part of planning. Multiple disaster experiences have shown that cellular phones fail in the first hours of a disaster, whether from crowded wavelengths or damaged equipment. People who live in high hazard areas need to plan for alternate means of contacting emergency services and each other.

Amateur radio is one system that can be battery operated and communicate by voice or digital messaging over long distances. Many communities have a FEMA Radio Amateurs in Civil Emergency Services (RACES) organization within the emergency operations agency. Some communities' amateur radio operators (hams) are part of the American Radio Relay League's Amateur Radio Emergency Service (ARRL/ARES), which may be independent of a government organization. These groups welcome new members and

will help to train them to pass the Federal Communications Commission's (FCC) test for a license. Experienced hams may use repeaters and high frequency radios that are capable of broadcasting across the United States and to other nations, while lower class licenses allow hams to broadcast using local repeaters.

Some communities have organized emergency communications using multi-use radio system (MURS) equipment that does not require a license. Unlike ham radios, the MURS are limited to 2 watts of power and may not be connected to a repeater. However, they work well for a local network within a neighborhood for emergency communication. This is especially important for people in areas with limited cellular phone coverage due to terrain problems. For example, neighborhoods in the Santa Cruz Mountains have explored these systems to augment their limited cell phone capacity. Some users have created a neighborhood system that ends with a RACES member who can send messages forward, or with a cell phone user who goes to a high area to transmit neighborhood concerns.



Figure 8. San Jose RACES at Field Day Using Emergency Broadcasting Methods *Source:* Unpublished photo, Dr. Frances Edwards

Satellite radios are another option for emergency use. While the infrastructure is more robust than cellular phones, there is a message limit for the satellites, and these phones have been oversold for the existing satellite capacity. In addition, there is a monthly fee for service, costing \$799 per year for 150 minutes of use, whether the minutes are used or not. These phones have been popular with emergency services organizations, but probably exceed the financial capacity of most neighborhoods.

People who live in areas with dynamic weather events—like wildfires and floods—may benefit from developing some alternate means of communicating to make joint decisions about evacuation, stay and defend or shelter in place strategies. These alternate systems are also helpful for personal emergencies like medical events or loss of power.

A more recent development is the use of digital volunteers from the community to help with monitoring online activity—such as social media posts, videos, blogs, or media articles—during an emergency event. These volunteers often emerge spontaneously during an event, but many emergency organizations have also formed Virtual Operations Support Teams (VOSTs) that consist of trusted individuals with tech skills (Eidam, 2018). Sometimes these groups are even used to help with message distribution online. Such volunteer groups can provide valuable expertise and surge support when organizations are short on resources and overwhelmed with internet-based tasks during an event. Consider forming relationships with digital volunteers from the community who can provide this kind of online support.

6.2. ACTIONS TO TAKE DURING EMERGENCIES

6.2.1. Use WEA, EBS and Alerting Technologies

Follow the templates required for the media outlet being used. WEA allows only 360 characters. Develop the messages in advance to make the best use of the limited space. Make sure that the messages are actionable.

Mileti and Sorenson (2018) emphasized that the content is the most important factor in generating action.

- Repeat the message frequently and specify exact action to take. The message content should include the source of the message, the hazard, the location in relation to the community, the consequences of the event, protective actions that should be taken, the amount of time available to take the protective action, how the action will reduce the consequences of the event, and the expiration time of the warning.
- Translate the message into community languages for delivering the warning. When
 possible, do these in advance so that only dates and times and specific locations have
 to be added, to limit preparation time. Consult your legal adviser regarding whether the
 appropriate city official should make any actions— such as evacuation—mandatory
 or voluntary, and consider the consequences of each option.
- Encourage followers to send the emergency information to their networks to magnify the impact of the message.

6.2.2. Consider Time of Day When Communicating

Communities have a variety of messaging options to use, so select the option that is most likely to attract the needed level of attention. During the day most cell phone users will quickly receive an alert to the phone, and others may have alert systems—for which they

have signed up with the local government—that arrive over landline phones or email. Radio and television broadcasts will reach yet other audiences.

At night there will be a need to stimulate community attention. While many cell phone users take their devices to bed with them, and would likely hear the phone's alert signal, others do not. Many people do not have cell phones. Therefore, older methods like public safety vehicle sirens and loudspeakers may be needed for exigent circumstances. Using multiple means of communicating will ensure that the message reaches the largest number of people quickly.

6.2.3. Regular Briefings at a Convenient Location

Work with public safety personnel to select a safe location that can be used consistently during the disaster event for regularly scheduled briefings. Using your media contacts, find a consistent channel/station to broadcast the briefings live at a consistent time daily until the event is resolved. Have the same spokesperson give the facts and updates. Include subject matter experts such as police chief, fire chief or public works director and a political leader to participate in the question-and-answer period. Consistency is reassuring to the public—someone is in charge. This was demonstrated after 9/11 when Mayor Rudi Giuliani gave regular updates to calm the community (Powell, 2007).

Ensure that media representatives have ready access to the briefings, and accommodate broadcast media cameras. Use maps and other illustrations as much as possible to reinforce the verbal message. Have bilingual staff available to be interviewed on camera by non-English stations, although often their bilingual reporters prefer to provide the on-camera commentary. For example, during the CZU Fire in 2020 the Cal Fire PIO held a daily briefing at 6 am that was broadcast on the same radio station daily. This allowed people in the threatened areas to hear the latest information from a trusted agent every day. During the SCU Fire at the same time, the CalFire PIO for that event held briefings at 7 am and updates at 3 pm every day at the Joint Information Center at the Alameda County Fairgrounds. Traditional media attended the briefings and provided updates to the community during newscasts.

6.2.4. Post on Social Media Regularly

Post the same information on social media that you gave at the news conference, but in the appropriate format for the site. Include video of the media briefing when appropriate. Use bilingual staff to deliver the message for non-English social media posts.

Mileti (2018) explains that there are three things that motivate people to act on emergency warnings. First, they need to know what the people they trust are doing or have done. Are the neighbors evacuating? Second, they need to know exactly what to do—evacuate, shelter in place, pack the car, listen to the EBS station—specific directions. Third, the message must be provided on multiple channels of communication and be repeated multiple times or ongoing.

6.2.5. Reply to Public Requests Quickly

Social media is a two-way communication tool. People will access social media to get more information (milling), to get confirmation of information from other sources, and to make requests for services. It is critical that public information specialists are assigned to monitor all social media channels and respond expeditiously to community requests for information and services. Sometimes the social media channel is the only means available to them to ask for help. Wood, et al. (2018) reported that during Hurricane Sandy the 9-1-1 system was overwhelmed, so people started using public agency social media channels to ask for help. An alert dispatcher recognized this pattern and began monitoring the requests and putting them into the 9-1-1 response system. Ideally there would be someone monitoring the social media accounts for requests who did not have simultaneous critical duties to perform.

To avoid unanswered requests for assistance, as well as duplicate requests for assistance, public agencies should adopt policies about how information from social media will be included in the triage element of the dispatching system. In most communities all such requests should go through the dispatch system to catch duplications, while speeding help to the most critical needs.

6.2.6. Manage Rumors and False Information

Social media is generally an unmonitored information exchange system. Participants can post anything with no editorial oversight or fact checking. Jong and Duckers (2016) note that even though social media participants may post new messages correcting initial misinformation, later users may repost old and outdated information, or information found to be rumor or misinformation. (For details on how some systems are monitored, see the Findings section on social media.)

The public's interaction with social media is often called "citizen journalism" because the contributor is writing a story. Unfortunately, most people posting to social media have no training in how to verify a story or the ethics of publishing unverified information (Birnhemer, 2018). People can write whatever they wish, with no interference by an editor, and that information may spread through re-posts or re-tweets before other users correct the errors. In the early days of social media, the crowd sourcing nature of the open platforms was supposed to make it self-correcting, but in an emergency the corrections may come too slowly to stop the damage done by unverified messaging.

This can lead to life threatening situations. For example, one observer reported that during the SCU fire in 2020, the residents of the Santa Clara County unincorporated portion of the Diablo Range were advised to evacuate, and a route was recommended. Shortly after the evacuation began, someone posted on Nextdoor that the recommended route was clogged, and Waze was recommending an alternate route, which the writer described. People started to follow the Nextdoor information rather than the official route, and they drove into the area where the fire fighters were actively fighting the fire (Anonymous public official, personal communication, 2021).

Agencies using social media to communicate with the public must be alert to rumors and false information and correct it quickly to avoid harm to the users. A PIO team is needed to monitor the posts, as well as the common operating picture developed in the EOC, to ensure that messaging to the community is accurate and enhances safety.

CONCLUSION

As noted by Esposti, et al. (2021), benevolence, competence and integrity are the critical elements of developing community trust in government. Mileti and Sorenson (2018) note that people delay acting while they create a new reality, moving from a perception of being safe to a realization of danger. Social media plays a key role in developing trust in government over time through effective and transparent communications with the community. If the public agency has been a trustworthy partner in good times, it is more likely that members of the community will rely on public agency messaging as they navigate the changes to move from safety to coping with danger.

ATTACHMENT 1

CATALOG OF PUBLIC INFORMATION OFFICER TRAINING AND GUIDANCE MATERIALS

This catalog is not exhaustive, but includes various types of training and resource materials that are available to public information officers at little or no cost. Also listed are conferences and videos that were recommended by subject matter experts as valuable sources of information.

Training Courses

Federal Emergency Management Agency Courses

Number/Title	URL or Reference	Annotation
Independent Study		
IS-29.A: Public Information Officer Awareness	https://training.fema.gov/is/courseover- view.aspx?code=IS-29.a	The Public Information Officer Awareness Course (IS0029) is designed to familiarize participants with the concepts underlying the PIO role. This course can provide a basic understanding of the PIO function for those new to the position. Additionally, it can provide those in executive level roles the necessary knowledge of PIO roles and responsibilities during an emergency.
IS-42.A: Social Media in Emergency Management	https://training.fema.gov/is/courseover- view.aspx?code=IS-42.a	The purpose of this course is to provide the participants with best practices including tools, techniques and a basic roadmap to build capabilities in the use of social media technologies in their own emergency management organizations (State, local, Tribal) in order to further their emergency response missions.
In-person Courses		
E/L0105 – Public Information Basics	<u>https://training.fema.gov/empp/e105.</u> aspx	To equip participants with the skills needed to be full or part-time PIOs, including oral and written communications; understanding and working with the media; and basic tools and techniques to perform effectively as a PIO, both in the proactive/ advocacy times and crisis/ emergency response.
G 290 Public Information Officer Basic	https://training.fema.gov/programs/pio/ g290.aspx	his two-day course will consider the value of communication before, during and after an incident. It will help PIOs identify critical audiences, both internal and external.
G 291/ LO387 Joint Information System/ Joint Information Center	https://training.fema.gov/programs/pio/ g291.aspx	This one-day course will outline the communications needed for different incidents and define the roles of the PIO within ICS.

Attachment 1

E/L0388 Advanced Public Information Officer	https://training.fema.gov/programs/pio/ e388.aspx	The National Response Framework (NRF) and the National Incident Management System (NIMS) devote significant attention to the importance of emergency public information. As shown in Figure 1, public information is one-third of one-fifth of NIMS under Command and Management, placing public information at the same level as the Incident Command System.
Master PIO Program	https://training.fema.gov/programs/pio/ masterpio.aspx	The Master Public Information Officer Program is a three-course series that prepares public information officers for an expanded role in delivering public information and warning using a strategic whole community approach. The program reinforces the qualities needed to lead whole community public information/external affairs programs, provides relevant management theories and concepts, and uses case studies to enhance public information/external affairs skill sets. MPIOP participants work within a collaborative environment on projects and establish a network of peers.
E/K0389 – Master Public Information Officer – Implementing Communications Strategies for Whole Community Leadership	https://training.fema.gov/programs/pio/ masterpio.aspx#E0389	Demonstrate how to use networking to influence programs, organizations and environments by conducting a networking activity; Describe how to explain to stakeholders the importance of engaging community executives in communications planning by applying the whole community concept to an analytical activity; Assess science-based research methods available to grow the Public Information body of knowledge by drafting initial ideas for the individual capstone project; and more
E/K0393 – Master Public Information Officer – Applying Advanced Concepts in Public Information and Communications	https://training.fema.gov/programs/pio/ masterpio.aspx#E0389	Discuss organizational analysis in preparation for analysis of a joint information center functional exercise; Discuss techniques for analyzing interpersonal relationships within a Joint Information Center during a functional exercise; Design a process for analyzing a joint information center functional exercise; and more
E0394 – Master Public Information Officer – Mastering Public Advocacy Plans to Create an Effective Community of Stakeholders	https://training.fema.gov/programs/pio/ masterpio.aspx#E0389	Develop body of knowledge report through consolidated review of multiple joint information center functional exercise analysis reports; Propose how strategic PIO leaders coordinate the actions of stakeholders and emergency management agencies to achieve a common purpose; and Design, Develop and implement a research project to contribute to the public information body of knowledge.

National Wildfire Coordinating Group Courses

S-203, Introduction to Incident Information, 2008	https://www.nwcg.gov/publications/ training-courses/s-203	The purpose of this course is to provide students with the skills and knowledge needed to serve as Public Information Officers (PIOF). The course covers establishing and maintaining an incident information operation, communicating with internal and external audiences, working with the news media, handling special situations, and long-term planning and strategy.
Wildland Fire Public Information Officers Webinar, 2020	https://www.nifc.gov/fire-information/ pio-bulletin-board/training-qualifica- tions-pios	Video and PowerPoint provided. Wildland fire response during COVID-19; Season themes; PIO Bulletin Board resources and requests; Social media; FireNet migration; InciWeb best practices; IROC reporting
Social Media for PIOS	https://www.nifc.gov/fire-information/ pio-bulletin-board/social-media	Course in the use and management of social media in a wildland fire setting.

California Specialized Training Institute Courses

Advanced Public Information Officer LO388	https://www.caloes.ca.gov/California- SpecializedTrainingInstituteSite/Docu- ments/Advanced%20Public%20Infor- mation%20Officer%20(L0388).pdf	Advanced course builds on the Basic and Intermediate courses. Learn to establish, manage and work within a Joint Information Center. Coordinate a message, earn strategic messaging; earn to manage PIO personnel under stress.
Intermediate Public Information Officer IPIO	https://www.caloes.ca.gov/California- SpecializedTrainingInstituteSite/Docu- ments/Intermediate%20Public%20Infor- mation%20Officer%20(IPIO).pdf	Before during and after an emergency, whole community approach, access and functional needs, recovery and strategic messaging.
Public Information Basics L0105	https://www.caloes.ca.gov/Califor- niaSpecializedTrainingInstituteSite/ Documents/Public%20Information%20 Basics%20(L0105).pdf	Train to be PIO, written and spoken communications, work effectively with the media; basic tools and techniques, advocacy and crisis management modes.
Public Information Officer Specialist Certificate Program	https://www.caloes.ca.gov/cal-oes- divisions/california-specialized-training- institute/credentialing-certificate-pro- grams/specialist-certificate-programs	Requires Basic, Advanced and 3 electives
NOAA Courses		
Seven Best Practices for Risk Communication	https://coast.noaa.gov/digitalcoast/train- ing/risk-communication.html	Understanding risk is a key component for initiatives focused on helping communities prepare for and respond to weather and climate hazards. This interactive webinar introduces participants to seven best practices, numerous techniques, and examples for communicating about coastal hazards. Focus is on public education and preparedness.
Videos

Mileti, D. (2018, 2/13). FEMA Prep Talk: Modernizing Public Warning Messaging.	https://www.fema.gov/blog/preptalks-dr- dennis-mileti-modernizing-public-warn- ing-messaging	Showcases the latest research on public alerts and warnings, provides practical guidance on how to write alert messages, and showcases the importance of using multiple delivery methods to promote public action more effectively. He provides practical guidance on messaging strategies and tactics that can save lives by reducing the time between warning message and public action.
Mileti, D., 2018 Research Forum Video Interview. California Earthquake Authority.	https://www.earthquakeauthority.com/ About-CEA/Research-Outreach/CEA- Research-Forum/2018-Video-Interviews/ Dennis-Mileti-Univ-of-Colorado	An interview on how to help motivate people to protect themselves from disasters and catastrophes.
Mileti, D. (2019, 1/3) Winter Meeting of the National Tsunami Hazard Mitigation Program, Public Warning Messaging	https://www.youtube.com/ watch?v=yB7AsGlifr8&t=3s	Hilton, San Diego, Mission Valley. Talk on steps for improving public messaging. Discusses updated information on warning creation and planning for public messaging.

Austin, L., Liu, B.F. & Jin, Y. (2012). How Audiences Seek Out Crisis Information: Exploring the Social- Mediated Crisis Communication Model	<i>Journal of Applied Communication</i> <i>Research,</i> 40:2, 188-207, DOI: 10.1080/00909882.2012.654498	Audiences use social media during crises for insider information and checking in with family/friends, and use traditional media for educational purposes. Convenience, involvement, and personal recommendations encourage social and traditional media use, while credibility encourages traditional media use.
Bean, H., Sutton, J., Liu, B.F., Madden, S., Wood, M.M. & Mileti, D.S. (2015). The Study of Mobile Public Warning Messages: A Research Review and Agenda.	<i>Review of Communication,</i> 15:1, 60-80, DOI: 10.1080/15358593.2015.1014402	In 2011 the FCC authorized governments to send 90-character WEAs to directly notify mobile device users of emergencies. The messages are geographically targeted, but pose challenges in designing the brief messaging.
Bean, H., Liu, B.F., Madden, S, Sutton, J., Wood, M.M. and Mileti, D.S. (2016). Disaster Warnings in Your Pocket: How Audiences Interpret Mobile Alerts for an Unfamiliar Hazard	<i>Journal of Contingencies and Crisis Management,</i> Volume 24 Number 3. September	WEAs and tweets were often deemed confusing, difficult to believe and impersonal. Participants also consistently found WEAs and tweets to be fear inducing and uninformative. The findings compel improvements in the way that WEAs and tweets are currently written, as well as indicate future directions for applied risk and crisis communication theory development.
Brandeau, M.L., Zaris, G.S., Freiesleben, J., Edwards, F.L., & Bravata, D.M. (2008). An Ounce of Prevention: Improving Communication to Reduce Mortality	American Journal of Disaster Medicine, vol. 3, no. 2, March/April 2008. <u>https:// www.wmpllc.org/ojs/index.php/ajdm/</u> article/view/1874	Communication during the response to a bioterror attack must involve the right information delivered at the appropriate time in an effective manner from trusted sources. Tabletop planning and simulation exercises, and other up-front investments in the design of an effective communication strategy, are critical for effective response planning.
Grimmelikhuijsen , S. & Knies, E. (2017). Validating a scale for citizen trust in government organizations.	International Review of Administrative Sciences, Vol. 83(3) 583–601.	Citizen Trust in Government Organizations' scale is validated using data from two different samples (total n=991), resulting in a scale of nine items measuring three dimensions: perceived competence, benevolence, and integrity. This scale can be used by other researchers and is valuable to gain a more specific and multi-dimensional understanding of trust in government organizations.
Imran, M., Castillo, C., Diaz, F. & Vieweg, S. (2015). Processing social media messages in mass emergency: A survey.	ACM Computing Surveys, Vol. 47, No. 4, Article 67, June. DOI: <u>http://dx.doi.</u> org/10.1145/2771588	We survey the state of the art regarding computational methods to process social media messages and highlight both their contributions and shortcomings.
Mileti, D. and O'Brien, P. Warnings during Disaster: Normalizing Communicated Risk	Social Problems Vol. 39, No. 1 (Feb., 1992), pp. 40-57 (18 pages). <u>https://doi.org/10.2307/3096912</u>	The theory of risk communication was tested with data on public perception of risk and response to aftershock warnings during the post-impact Loma Prieta earthquake emergency. Findings from samples of households in Santa Cruz and San Francisco Counties were consistent.

63

Panagiotopoulos, P., Barnett, J. Ziaee Bigdeli, A. & Sams, S. (2016). Social media in emergency management: Twitter as a tool for communicating risks to the public.	Technological Forecasting & Social Change, 111:86–96	Social media accounts offer an opportunity to rapidly distribute critical information and in doing so to mitigate the impact of emergencies by influencing public reactions. This article draws on theories of risk and emergency communication in order to consider the impact of Twitter as a tool for communicating risks to the public.
Simona, T., Goldberg, A. & Adinia, B. (2015). Socializing in emergencies—A review of the use of social media in emergency situations.	International Journal of Information Management 35: 609–619.	Social media provides opportunities for engaging citizens in the emergency management by both disseminating information to the public and accessing information from them. During emergency events, individuals are exposed to large quantities of information without being aware of their validity or risk of misinformation, but users are usually swift to correct them, thus making the social media "self-regulating".
Wood, M.M., Mileti, D.S., Bean, H., Liu, B.F., Sutton, J. & Madden, S. (2018). Milling and Public Warnings.	Environment and Behavior Vol. 50(5) 535– 566. DOI: 10:1177/0013916517709561	Discovering whether it is possible to craft mobile alerts for imminent events in a way that reduces people's tendency to seek and confirm information before initiating protective action is essential. The purpose of this study was to examine the possibility of designing messages for mobile devices, such as WEA messages, to minimize action delay.
Wood, M.M., Mileti, D.S., Kano, M., Kelley, M.M., Regan, R.& Bourque, L.B. (2012). Communicating Actionable Risk for Terrorism and Other Hazards.	<i>Risk Analysis</i> , Vol. 32, No. 4.DOI: 10.1111/j.1539-6924.2011.01645.x	Clear results emerged that provide a strong basis for communicating actionable risk, and for the conclusion both that information observed (seeing preparedness actions that other have taken) and information received (receiving recommendations about what preparedness actions to take) play key, although different, roles in motivating preparedness actions among the people in our nation.

Conferences

SMILE Conference: Social Media, Internet and Law Enforcement	https://smileconference.com/	Focus on using social media – making accounts, networking, speakers who address actual events as examples.
Government Social Media Conference (GSMCOM)- annual event. Government Social Media LLC 245 E. Liberty Street, Ste. 230, Reno, NV 89501	https://www.governmentsocialmedia.com/gsmcon	Participants learn practical skills for managing public sector social media and get opportunities to network with agencies across the country. Major social networks, industry leaders & experts will share updates and strategies and meet participants.

Resources

National Wildfire Coordinating Group

NWCG Public Information Officer Social Media Reference and Guidance Updated: March 2020	https://www.nwcg.gov/sites/default/files/committee/docs/ piosc-nwcg-pio-sm-references-and-guidance.pdf	This document is intended to direct Public Information Officers and others to information and references for appropriate guidance on the use of social media. Although much of this information is agency- specific, many of the concepts and best practices referenced are broadly applicable across the wide range of incidents that public information officers support
Guidelines: Firefighter Photography, Video and Social Media Use	https://www.nifc.gov/sites/default/files/pio/documents/photo_ video_NIFC.pdf	Almost anyone in the fire organization now has the capability to shoot video or photographs and post them within minutes. Social media enables firefighters to express a thought or opinion almost at any time from any location.
Interagency Lessons Learned on Using Social Media on Wildland Fire Incidents March, 2012	https://www.nifc.gov/fire-information/pio-bulletin-board/ social-media	The purpose of this document is to provide information on structured use of social media on incidents. If you are working on an incident and creating or contributing to blogs, microblogs, wikis, social networks, virtual worlds, or any other kind of social media, these lessons might help.
Public Information Officer Type 1 Task Book	https://www.nwcg.gov/positions/pio1/position-ipd	Incident Position Description
Public Information Officer Type 2 Task Book	https://www.nwcg.gov/positions/pio2/position-ipd	Incident Position Description
Public Information Officer, Technician	https://www.nwcg.gov/positions/piot/position-ipd	Incident Position Description
Incident Resources for PIOs	https://www.nifc.gov/fire-information/pio-bulletin-board/ incident-resources	FireNet Users Guide and PIO Toolbox

Federal Agencies

FEMA. Improving Public Messaging for Evacuation and Shelter-in-Place (2021).	https://www.fema.gov/sites/default/files/documents/fema_ improving-public-messaging-for-evacuation-and-shelter-in- place-companion-slide-library_slide-deck.pdf	Slide deck introducing the study. Findings and recommendations for emergency managers from peer-reviewed research.
FEMA. Improving Public Messaging for Evacuation and Shelter-in-Place	https://www.fema.gov/sites/default/files/documents/fema_ improving-public-messaging-for-evacuation-and-shelter-in- place_literature-review-report.pdf	Full document. Identifies relevant concepts, considerations, and principles that can inform jurisdictions in planning for evacuation and/ or shelter-in-place protective actions; peer-reviewed research and presents recommendations for informing community members about risk and providing effective warnings.
FEMA. National Incident Management System Basic Guidance for Public Information Officers December 2020	https://www.fema.gov/sites/default/files/documents/fema_ nims-basic-guidance-public-information-officers_12-2020. pdf	This publication provides operational practices to help PIOs perform their duties within the National Incident Management System (NIMS) Command and Coordination structures. Before, during, and after an incident,2 coordinated and timely communication to the public is critical. Effective communication can save lives and property, and can promote credibility and public trust.
FEMA. PIO Position checklist	https://training.fema.gov/emiweb/is/icsresource/assets/ pio_pcl.pdf	FEMA. PIO Position checklist
Mileti, D. (2018, 2/13). Prep Talk Discussion Guide	https://www.fema.gov/sites/default/files/documents/fema_ preptalks_mileti_discussion-guide.pdf	Discussion companion to the Mileti FEMA Prep Talk.
Mileti & Sorenson. (2015). A Guide to Public Alert and Warning for Dam and Levee Emergencies. USACE.	https://www.publications.usace.army.mil/Por- tals/76/Users/182/86/2486/EP%201110-2-17. pdf?ver=2019-06-20-152050-550	Mileti & Sorenson. (2015). A Guide to Public Alert and Warning for Dam and Levee Emergencies.

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National Research Council. (2011). Public Response to Alerts and Warnings on Mobile Devices: Summary of a Workshop on Current Knowledge and Research Gaps.	The National Academies Press, Washington, D.C., 2011. file:///C:/Users/002060436/Documents/Down- loads/13076%20(1).pdf	The workshop report includes (1) the extensive body of knowledge regarding alerts and warnings and the public response and action before, during, and after emergency situations; and (2) the many questions that arise when considering how to apply this knowledge to the Commercial Mobile Alert Service (CMAS), which is currently under development—and more generally to the use of mobile and other new information and communications technologies for alerts and warnings.
National Research Council. (2013). Public Response to Alerts and Warnings Using Social Media: Report of a Workshop on Current Knowledge and Research Gaps. Washington, DC:	The National Academies Press. <u>https://doi.org/10.17226/15853</u>	The workshop investigated what is known about 1) public response to alerts and warnings delivered by social media, 2) official monitoring of social media, and 3) privacy concerns that result from social media monitoring.

ATTACHMENT 2

CATALOG OF RESEARH ON SOCIAL MEDIA AND TRUST IN GOVERNMENT

Social Media Use during Disaster Events

Reference	Summary
Palen, L., & Hughes, A. L. (2018). Social Media in Disaster Communication. In H. Rodriguez, W. Donner, & J. E. Trainor (Eds.), <i>Handbook of Disaster Research</i> (pp. 497–518). Springer International Publishing. <u>https://doi.org/10.1007/978-3-319-63254-4_24</u>	This paper summarizes the research regarding social media use during disaster events. It discusses how social media enable new types of interaction, how they can be used as sources of data, and how they can be used in emergency management.
Reuter, C., Hughes, A. L., & Kaufhold, MA. (2018). Social Media in Crisis Management: An Evaluation and Analysis of Crisis Informatics Research. <i>International</i> <i>Journal of Human–Computer Interaction</i> , 34(4), 280– 294. <u>https://doi.org/10.1080/10447318.2018.1427832</u>	The research area of crisis informatics seeks to under- stand the many ways that information is shared during a crisis event between emergency responders, members of the public and other affected parties. This paper exam- ines the crisis informatics literature from three different perspectives: case studies of different disaster events, explanations of the types of research typically found in crisis informatics, and a consideration of the types of interactions that happen between emergency authorities and the public.

Communicating Risk

Reference	Summary
Lindell, M. K. (2018). Communicating Imminent Risk. In H. Rodríguez, W. Donner, & J. E. Trainor (Eds.), <i>Handbook of Disaster Research</i> (pp. 449–477). Springer International Publishing. <u>https://doi.org/10.1007/978-3-</u> <u>319-63254-4_22</u>	Much research literature has focused on how risk can more effectively be conveyed to members of the public affected by disaster. This paper gives an overview of this research.
Wray, R. J., Rivers, J., Whitworth, A., & Jupka, K. (2006). Public Perceptions About Trust in Emergency Risk Communication: Qualitative Research Findings. <i>International Journal of Mass Emergencies and</i> <i>Disasters</i> , 24(1), 45–75.	Researchers conducted focus groups with different ethnic groups across the US to learn more about how people trust emergency responders and the messages they send. While this study was done before social media was widespread, it offers much insight into how people perceive and trust emergency responders and how that impacts communication strategies.

70

Social Media Practices of Emergency Management

Reference	Summary
Andrews, C., Fichet, E., Ding, Y., Spiro, E. S., & Starbird, K. (2016). Keeping Up with the Tweet-dashians: The Impact of "Official" Accounts on Online Rumoring. <i>Proceedings of the 19th ACM Conference on Computer-</i> <i>Supported Cooperative Work & Social Computing</i> , 452–465. <u>https://doi.org/10.1145/2818048.2819986</u>	This paper examines how online rumoring spreads during a disaster, and notes that "official" accounts can play a significant role in stopping this spread, by releasing timely information and correcting false rumors quickly.
Briones, R. L., Kuch, B., Liu, B. F., & Yin, Y. (2011). Keeping Up with the Digital Age: How the American Red Cross uses Social Media to Build Relationships. <i>Public Relations Review</i> , 37(1), 37–43. <u>https://doi.org/10.1016/j.pubrev.2010.12.006</u>	This paper explores how members of the American Red Cross (ARC) use social media. ARC members found social media to be a necessary two-way communication mechanism for engaging with and building relationships with the public during a disaster.
Denef, S., Bayerl, P. S., & Kaptein, N. (2013). Social Media and the Police-Tweeting Practices of British Police Forces during the August 2011 Riots. <i>Proceedings of the 2013 Conference on Human Factors</i> <i>in Computing Systems (CHI 2013)</i> , 3471–3480. <u>https:// doi.org/10.1145/2470654.2466477</u>	The study described in this paper analyzed the tweeting practices of two different police departments during a riot. One police department used a more detached and formal style of communication. The other department was more informal and personal in their communication style. The advantages and disadvantages of each strategy are discussed.
Hiltz, S. R., Hughes, A. L., Imran, M., Plotnick, L., Power, R., & Turoff, M. (2020). Exploring the usefulness and feasibility of software requirements for social media use in emergency management. International Journal of Disaster Risk Reduction, 42, 101367. <u>https://doi. org/10.1016/j.ijdrr.2019.101367</u>	Emergency practitioners, researchers and technologists took part in a survey to understand how software can better support emergency managers as they use social media. The paper analyzes how useful and feasible many of the suggested software features are.
Hughes, A. L., & Palen, L. (2012). The Evolving Role of the Public Information Officer: An Examination of Social Media in Emergency Management. <i>Journal of Homeland</i> <i>Security and Emergency Management</i> , 9(1). <u>https://doi. org/10.1515/1547-7355.1976</u>	Researchers interviewed public information officers (PIOs) to learn more about how PIOs use social media and the challenges to its effective use. PIOs often found value in social media as a data source and as a means to communicate with the public, but they faced challenges in using social media because they lacked support from management, training, tools for extracting useful information from social media, and the time and personnel to manage social media communications.
Kankanamge, N., Yigitcanlar, T., & Goonetilleke, A. (2020). How engaging are disaster management related social media channels? The case of Australian state emergency organisations. <i>International Journal of Disaster Risk Reduction</i> , 48, 101571. <u>https://doi.org/10.1016/j.ijdrr.2020.101571</u>	This paper finds that social media can be a useful tool for disaster management to engage with the disaster- affected public. Further, they found that social media posts related to situational awareness tended to receive more attention from the public than other posts.

Building Trust with the Public

Reference	Summary
Chauhan, A., & Hughes, A. L. (2020). Trustworthiness Perceptions of Social Media Resources Named after a Crisis Event. <i>Proceedings of the ACM on Human-</i> <i>Computer Interaction</i> , 4(CSCW1), 044:1-044:23. <u>https://</u> doi.org/10.1145/3392849	In this paper, researchers conducted a survey and interviews to discover how people evaluated the trustworthiness of social media accounts named after crisis events. They found that people evaluated trustworthiness of the accounts based on their content, information source, profile, and owner.
Hughes, A. L., & Chauhan, A. (2015). Online Media as a Means to Affect Public Trust in Emergency Responders. <i>Proceedings of the Information Systems for Crisis Re-</i> <i>sponse and Management Conference (ISCRAM 20015)</i> . http://idl.iscram.org/files/onlinemediaasameanstoaf- fectpublictrustinemergencyresponders/2015/1226_On- lineMediaasaMeanstoAffectPublicTrustinEmergencyRe- sponders2015.pdf	In this paper, researchers examined online media (i.e., Twitter, Facebook, and websites) from Fire and Police Departments affected by Hurricane Sandy. Based on this analysis, researchers offer 10 best practices for ways that emergency responders can build trust with the public.
Williams, B. D., Valero, J. N., & Kim, K. (2018). Social media, trust, and disaster: Does trust in public and nonprofit organizations explain social media use during a disaster? <i>Quality & Quantity</i> , 52(2), 537–550. <u>https://doi.org/10.1007/s11135-017-0594-4</u>	This study examined how members of the public use social media during a disaster and whether they trusted social media from official organizations (like emergency responders). They find that local official organizations are trusted more than federal organizations, and they recommend that local officials should strive to engage with their public through social media to build trust and broaden the reach of their messaging.

Improving Disaster Communications with the Public

Reference	Summary
Bean, H., Liu, B. F., Madden, S., Sutton, J., Wood, M. M., & Mileti, D. S. (2016). Disaster Warnings in Your Pocket: How Audiences Interpret Mobile Alerts for an Unfamiliar Hazard. <i>Journal of Contingencies</i> <i>and Crisis Management</i> , 24(3), 136–147. <u>https://doi. org/10.1111/1468-5973.12108</u>	Short messaging channels like WEA and Twitter are often used in disaster management, and this study sought to understand how effective these channels are for disaster communication. Findings indicate that people often found WEAs and tweets confusing, hard to believe, and too formal, as well as fear inducing and not helpful. The paper offers ways to improve these communications.
FEMA. (2021). Improving Public Messaging for Evacuation and Shelter-in-Place: Findings and Recommendations for Emergency Managers from Peer- Reviewed Research. <u>https://www.fema.gov/sites/default/</u> <u>files/documents/fema_improving-public-messaging-for- evacuation-and-shelter-in-place_literature-review-report.</u> <u>pdf</u>	This report surveys the research literature and offers a series of best practices and recommendations for improving public communications for evacuation and shelter-in-place directives.
Liu, B. F., Wood, M. M., Egnoto, M., Bean, H., Sutton, J., Mileti, D., & Madden, S. (2017). Is a picture worth a thousand words? The effects of maps and warning messages on how publics respond to disaster information. <i>Public Relations Review</i> , 43(3), 493–506. https://doi.org/10.1016/j.pubrev.2017.04.004	In this paper, researchers tested whether images sent in disaster messaging could improve the way that the public responds to the disaster. They found that images of maps that enhance understanding of the message were more likely to affect the response of the public.
Sutton, J. N., & Kuligowski, E. D. (2019). Alerts and Warnings on Short Messaging Channels: Guidance from an Expert Panel Process. <i>Natural Hazards Review</i> , 20(2), 04019002. <u>https://doi.org/10.1061/(ASCE)</u> <u>NH.1527-6996.0000324</u>	This paper offers practical advice, guidance, and examples for how to construct more effecting alert and warning messages over short messaging channels like Twitter and WEA.

Wildfire Evacuation Communication

Reference	Summary
Edgeley, C. M., & Paveglio, T. B. (2019). Exploring influences on intended evacuation behaviors during wildfire: What roles for pre-fire actions and event-based cues? <i>International Journal of Disaster Risk Reduction</i> , 37, 101182. <u>https://doi.org/10.1016/j.ijdrr.2019.101182</u>	This paper explores cues that influenced people to evacuate during a wildfire. Researchers found that evacuation planning might be improved if it incorporates more of these cues into guidance for evacuation.
McCaffrey, S., Wilson, R., & Konar, A. (2018). Should I Stay or Should I Go Now? Or Should I Wait and See? Influences on Wildfire Evacuation Decisions. <i>Risk</i> <i>Analysis</i> , 38(7), 1390–1404. <u>https://doi.org/10.1111/</u> <u>risa.12944</u>	This research paper examined the factors that affect a person's decision to evacuate, stay to defend, or wait and see during a wildfire. Results show a range of factors exist, including differences in how risk is perceived and different cues to act on (e.g., an encroaching fire line, warnings from officials).

McLennan, J., Ryan, B., Bearman, C., & Toh, K. (2019). Should We Leave Now? Behavioral Factors in Evacuation Under Wildfire Threat. *Fire Technology*, 55(2), 487–516. <u>https://doi.org/10.1007/s10694-018-0753-8</u> This paper surveys research about wildfire evacuations. It finds that some people choose to evacuate, some remain on their property, others will delay their evacuation, and still others may return to their property after learning of the evacuation order. The paper considers factors that affect evacuation decisions and offers suggestions for how emergency responders might improve evacuation compliance.

ATTACHMENT 3

EXAMPLES OF OUTREACH MATERIALS



EMERGENCY KIT FOR THE CAR

WATER. <u>This is your most important item.</u> You will need water to drink, for first aid, and to take medicine. In your kit, have at least one gallon of water per person, based on who usually rides in your car. You could purchase a box of foil packets or cans of water at a camping store, or one-liter bottles in a 20-bottle flat.

PRESCRIPTION MEDICATIONS. <u>This is the second most important item.</u> If you take medications on which your health depends you must carry a three-day supply at all times. This would include heart, blood pressure and diabetic medications. If you regularly take other prescription drugs for allergies or other health concerns, it is also wise to carry these. Keep this supply fresh by rotating it every week. Also include any non-prescription medications you often use: nose drops, antihistamine, allergy remedies, diarrhea medication, headache remedies or indigestion medications. In times of stress such as an emergency health problem can become worse. Having proper medications and keeping to the prescribed schedule is very important.</u>

FOOD. Food is important for psychological reasons and to keep your blood sugar level up to avoid dizzy or shaky feelings. For this reason, you should select food for your kit that you like and that you are used to eating. In addition, people with diabetes, heart disease, or other health problems should consult their physicians for advice about the foods for their kits. The healthy general public should select foods like crackers, peanut butter, snack packs of fruit or pudding, granola bars, protein bars, dried fruit, water-packed tuna or chicken and single serving cans of juice. Plan on four light meals per day.

Avoid high sugar foods like candy and soft drinks as they make you very thirsty. Avoid alcoholic beverages.

Avoid MREs, as they are very high in fat and sodium and can make you very sick if you are not accustomed to a high fat diet.

Avoid "emergency food bars" as they are designed for shipwrecked people who are sedentary in a boat and may get seasick. They are designed to keep blood sugar up in a few bites. They are not designed to satisfy hunger in a person who is moving around

and working. They are also very high in sugar and fat.

Avoid camping foods and other dried food, as they require a lot of water consumption to metabolize. They are also high in calories.

LIGHT SOURCE. A chemical light stick provides long shelf life and a sparkless source of light. A flashlight with a special long-life battery or a long-burning candle may be used after you have checked to be sure that there is no leaking gas or petroleum in the area. Do not rely on a regular flashlight as ordinary batteries lose their power quickly in the heat of a car. You might consider an electric light with an attachment to your car cigarette lighter, available at camping stores.

COMMUNICATION. Your cell phone can be charged from your car battery. Use only the text function in a disaster to conserve battery life and bandwidth. Even when the voice function will not work it is likely that a text will go through. Put your spouse or parents' numbers in the ICE function, and keep other key numbers in the directory.

RADIO. Your car radio is your source for emergency broadcast information. Get a list of all-news stations for the area where you live, work, and areas you drive to or through. Keep this list in your glove compartment and in your emergency kit. A hand cranked emergency radio is also useful and eliminates the need for batteries. These often come with flashlights that run on the same power source. Some also have a solar power panel.

EMERGENCY BLANKET. Mylar emergency blankets are available at camping-goods stores. They can be used as a blanket or a heat shield against the sun. They fold into a small package. A thermal blanket may be added when storage space permits.

FIRST AID SUPPLIES. Include 4x4 gauze, cloth that can be torn into strips to hold a bandage in place, Kerlex, anti-bacterial ointment (such as Neosporin, Bacitracin), burn cream, rolls of gauze, large gauze pads, rolls of first aid tape, scissors, a large cloth square for a sling or tourniquet, safety pins, needles and heavy thread, matches, eye wash, a chemical ice pack and a first aid book. Rotate the medical supplies every six months.

PERSONAL CARE AND HYGIENE ITEMS. Alcohol-based hand sanitizer, baby wipes, small plastic bottle of pine oil or other disinfectant, six large heavy-duty garbage bags with ties for sanitation and waste disposal, box of tissues, roll of toilet paper, plastic bucket to use as a toilet after lining it with a plastic garbage bag. (Your smaller kit items can be stored in your bucket inside a sealed trash bag). Tooth brush/tooth paste, mouth wash, deodorant, face cloth, folding cup, and other person items should be based on personal needs.

ADDITIONAL ITEMS TO CONSIDER. Sturdy shoes (especially if your work shoes are not good for walking), sweater or jacket, hat/sun visor, feminine hygiene supplies, whistle (to attract attention and call for help), rope or string, pencil and paper, safety pins,

\$100 in small bills to buy essential supplies in case the ATM does not work, a roll of quarters for a pay phone. Add appropriate climate-related items like sun screen or gloves.

DON'T LET YOUR GAS TANK FALL BELOW HALF FULL! The radio and heater in your car may save your life, but you can't run the car's accessories long without the gas to start the engine and re-charge the battery. If you travel in isolated areas, on the freeway, or far from home, an adequate gasoline supply is crucial. Fill up often. After a disaster the gas pumps may not work for several days while electrical power is restored, and once the pumps work, the supplies will quickly be depleted through panic buying. NEVER CARRY CANS OF GAS IN YOUR TRUNK! A can of gas is a bomb!

Frequently Asked Questions

What is a CERT Member?

A **CERT** member is a person who is trained to prepare for and respond after a disaster in their neighborhood. A group of ten or more members of a neighborhood, apartment complex, business, or similar residential area comprise a team. Persons not affiliated with a team may serve as individuals.

Who may join a CERT?

CERT is for anyone who is interested in helping his or her neighborhood prepare for a disaster and provide assistance afterward. Team training is preferred however persons may be trained even if they are not affiliated with a team.

Where can I get more information about the CERT program ?

Contact the City of Palm Bay Office of Emergency Preparedness at: (321) 952-3400 Ext. 4504 or E-mail to: schulm@palmbayflorida.org

The CERT Information Line:

(321) 952-3400 Ext. 4504 - This information line will make available training schedules and other information relevant to the CERT program

CERT WEBSITE RESOURCES:

City of Palm Bay Office of Emergency Preparedness Program information and emergency preparedness tips schulm@palmbayflorida.org

Federal Emergency Management Agency: http://www.fema.gov/emi/cert Information about the National CERT program and links to other CERT sites

Continuing Education:

Refresher classes are held several times a year and are open to all teams based on availability and need.

Some of the other available continuing education courses:

- Terrorism Awareness
- Communications (Amateur radio operations, hand-held)
- CPR courses are available. Contact the Palm Bay Fire Department at 321-409-6300
- Critical Incident Stress
 Management
- Large-scale disaster simulations are held once- a -year where all teams are invited to participate.

*CPR is NOT considered a component of CERT training.



CITY OF PALM BAY

OFFICE OF EMERGENCY PREPAREDNESS

Palm Bay Fire Department

You're On Your Own!

An Introduction to the Community Emergency Response Team (CERT)

Did you know ...?

- There is a very good chance that your neighborhood will be on its own during the early stages following a catastrophic disaster.
- After a catastrophic disaster, citizens will volunteer to help. Without proper training these people can expose themselves to potential injury and even death!
- Experience has shown that basic training in disaster survival and rescue skills improves the ability of citizens to survive until responders or other assistance arrives

City of Palm Bay Community Emergency Response Team (CERT) Program

The City of Palm Bay Office of Emergency Preparedness (OEP) has become a part of a national network of CERT communities. OEP has developed a program that is designed to help neighborhoods prepare for and respond after catastrophic disasters such as hurricanes, tornadoes, and other major emergencies. Individuals completing CERT training may be affiliated with one or more of the following teams:

- Neighborhood CERT: Ten or more neighbors serving immediate residential neighborhood.
- Business or Government CERT:

Co-workers serving places of business and surrounding areas, or county, municipal, or state agency employees

- School CERT: Faculty and staff serving a particular school and the surrounding areas.
- Faith-Based CERT: Teams based at a house of worship serving the immediate neighborhood, or travel into areas that need assistance.
- Youth CERT: Organized serviceoriented groups, such as Civil Air Patrol, Fire or Police Explorers, or school-based clubs. 16 years and older.

Individuals not affiliated with a team may still be trained and serve the Palm Bay community.

Once trained, a **CERT** will be able to provide the following services to their neighborhood:

- Increase their neighborhood's disaster readiness
- Perform triage and provide medical services to the injured
- Perform light search and rescue operations
- Extinguish small fires and teach fire safety.
- Assess damage after a disaster
- Organize procurement of supplies

CERT Course Content

The basic course will include those components necessary to get the team started and become capable of performing basic **CERT** functions. Each member must complete 32 hours of classes in the following areas to become certified. Classes are scheduled to accommodate the needs of each team and are available at convenient times.

Teams will learn:

Disaster Preparedness: Instructs team members how to prepare themselves and their neighborhoods for the various hazards that may occur.

Team Organization and Disaster Psychology:

Addresses organization and management principles necessary for a **CERT** to operate successfully. Covers critical incident stress for victims as well as workers.

Medical Operations: Team members will learn how to conduct triage, establish medical treatment areas, and provide basic first aid for victims.

Damage Assessment: Team members will learn how to rapidly assess damage employing a standardized format used throughout the city.

Disaster Simulation: A small-scale disaster simulation is also a part of the basic program.

Fire Suppression: Team members will learn how to use extinguishers and other equipment to suppress small fires.

Light Search and Rescue: Team members will learn light search and rescue planning, techniques, and rescuer safety.



Confidential Household Data for Your Disaster Kit

Address:		Phone:
Adult Name:		Work Phone:
Employer:		Work Hours:
Adult Name:		Work Phone:
Employer:		Work Hours:
Other adults in the household: Any with disabilities?:		
Children	Birth Year	School
Persons authorized to pick-up child	 Iren from school (i	nfo on emergency release card)
Name		Phone
Pets in Household: Type: Type:	Medical Problems Medical Problems	
Туре:	Medical Problems	
Household Cell Phones, E-mail add	dresses, Ham Ra	dio Call Signs, etc.
What language is spoken at home:		
What languages can you act as a tra	anslator for:	
Important Medical Conditions in Fa	mily, including alle	ergies and special medications:

Mineta Transportation Institute, 210 N. Fourth St., 4th Floor, San Jose, CA 95112

Address			
Dut of Area Contact:	Relationship:	City:	Phone:
Family meeting place: Address:			
hone:			
Make a rough sketch of yo electric switches. Show e your emergency and first	our home showing the least ntry and exits, location aid supplies.	ocations of gas of pool or hot tu	& water valves and b. Include location of
Hot Water Heater Strappe	d Top & Bottom Yes	No	Need Help

What neighborhood teams are your family members part of?

Mineta Transportation Institute, 210 N. Fourth St., 4th Floor, San Jose, CA 95112

WILDFIRE EVACUATION CHECKLIST

Learn more at www.firesafemarin.org/preparedness/evacuation



If evacuation is anticipated and time allows, follow this checklist to give your family and home the best chance of survival. Complete the Family Communication Plan on the opposite side for each family member and keep in your wildfire and emergency "Go Kit(s)."

EVACUATION NOTIFICATIONS & INFORMATION Register for Alert Marin and Nixle to receive evacuation and fire information notices!

ALERT MARIN www.alertmarin.org Used when emergency action is needed at a specific address: wildfires, imminent flooding, evacuations, or other public safety incidents where lives may be at risk; critical information about evacuation routes, hazards, and shelters. Online registration required!

EVACUATION ORDER: Leave now! Evacuate immediately. Do not delay to gather valuables or prepare your home. Follow any directions given in the evacuation order.

ALWAYS:

COMMUNICATIONS

- □ Keep your cell phone fully charged.
- Notify an out-of-area contact of your phone number, location and status. Update regularly.
- Leave a note with your contact info and out-of-area contact taped to fridge or inside a front window.
- Check on or call neighbors to alert them to prepare at first sign of fire.

ON YOUR PERSON

- Dress all family members in long sleeves and long pants; heavy cotton or wool is best, no matter how hot it is.
- Wear full coverage goggles, leather gloves, head protection.
- Cover faces with a dry cotton or wool bandanna or scarf over an N95 respirator. Tie long hair back.
- Carry a headlamp *and* flashlight (even during the day).
- Carry car keys, wallet, ID, cell phone, and spare battery.
- Drink plenty of water, stay hydrated.
- Det "Go Kits" (reverse) in your vehicle.

PETS & ANIMALS

- Locate your pets and place in carriers NOW. You won't be able to catch them when the fire approaches.
- Be sure your pets wear tags and are registered with microchips.
- Place carriers (with your pets in them) near the front door, with fresh water and extra food.
- Prepare horses and large animals for transport and consider moving them to a safe location early, before evacuation is ordered.

Wildfire Evacuation Checklist and Family Communication Plan (2019-07-17)

NIXLE www.nixle.com Used to provide **incident information** for a specific **zip code**: road closures, general updates, issues affecting larger areas; post-disaster information about shelters, transportation, or supplies; police activity and general public safety information.

EVACUATION WARNING: Evacuate as soon as possible. A short delay to gather your *Go Kit* and prepare your home may be OK. Leave if you feel unsafe or conditions change.

IF TIME ALLOWS:

INSIDE THE HOUSE

- Shut all windows and doors (interior too) and leave them *unlocked*.
- Remove combustible window shades and curtains; close metal shutters.
- Move furniture to the center of the room, away from windows.
- Leave indoor and outdoor lights on.
- Shut off HVAC and ceiling fans.

OUTSIDE & IN NEIGHBORHOOD

- Place combustible outdoor items (patio furniture, toys, doormats, trash cans, etc.) in garage or 30' from structures (optional: place in a pool).
- Shut off gas at the meter or propane tank; move small tanks at least 15' away from combustibles.
- Connect garden hoses with squeezegrip nozzles to outdoor spigots for use by firefighters.
- Fill water buckets and place around outside of house, especially near decks and fences.
- Clean your gutters and blow leaves away from house.
- Back your car into driveway, loaded, with doors and windows closed.
- Prop open fence and side gates.
- Place ladder(s) at the corner(s) of structures for firefighters.
- Seal attic and ground vents with precut plywood or metal covers (even duct tape will protect from ember entry) if time allows.
- Patrol your property and monitor conditions. Leave if spot fires ignite or conditions change.

SOCIAL MEDIA, RADIO, TV

Used to provide less critical and low level frequent **updates** intended for larger populations: traffic updates, road closures, incident updates, and contact information; safety announcement, power outages, minor issues; disaster recovery resources.

SHELTER IN PLACE: Stay in your current location or the safest nearby building or unburnable area. May be required when evacuation is impossible, too dangerous, or unnecessary.

WHEN YOU LEAVE:

- Leave immediately if ordered.
- Don't wait for an evacuation order if you feel unsafe or conditions change; leave early if unsure.
- Assist elderly or disabled neighbors.
- Carpool with neighbors to reduce traffic.
- Take only essential vehicles with adequate fuel.
- In your car, turn on headlights, close windows, turn on inside air and AC, tune to local radio.
- Drive slowly and defensively; be observant.
- The best evacuation route is usually the one you know best. Take the fastest paved route to a valley floor, away from the fire if possible.
- Proceed downhill, away from the fire if possible. Know at least two routes.
- If roads are impassable or you are trapped: take shelter in a building, car, or an open area; park in an outside turn if trapped on a hillside; stay far from vegetation; look for wide roads, parking lots, playing fields, etc.
- If trapped, you are better protected inside a building or vehicle.
- Don't abandon your car in the road if passage is impossible. If you must leave your car, park it off the road and consider other options for shelter.
- Evacuate on foot only as a last resort.
- Don't evacuate by fire road, uphill, or into open-space areas with unburned vegetation.
- Remain calm panic is deadly.
 - FIRESafe MARIN | www.firesafemarin.org

FIRE Safe	SCHOOL, CHILDCARE, CAREGIVER, WORKPLACE	OUT-OF-AREA CONTACTS
MARIN		
	AUDRESS	ADURE33
		DUONE
N	PHONE	PHUNE
tour Family's Name	EMAIL	EMAIL
Family Emergency Communications Plan	WEB	
	EMERGENCY PLAN/PICKUP	NAME
		ADDRESS
HOUSEHOLD INFORMATION		
ADDRESS	NAME	PHONE
	ADDRESS	EMAIL
PHONE		EMERGENCY MEETING LOCATIONS
EMAIL	DUONE	LOCATION 1
		INSTRUCTIONS
NAME	EMAIL	
MORILE	WEB	
Chiali	EMERGENCY PLAN/PICKUP	
UTHER # OF SUCIAL MEDIA		
	NAME	LOCATION 3
NAME	ADDRESS	INSTRUCTIONS
MOBILE		
EMAIL	PHONE	IMPORTANT NUMBERS & INFORMATION
OTHER # or SOCIAL MEDIA	FMAIL	FIRE & MEDICAL EMERGENCIES IN MARIN 911 or 415-472-0911
	WED	POLICE, SHERIFF EMERGENCIES IN MARIN 911 or 415-472-0911
NAME		MARIN FIRE INFORMATION HOTLINE 415-473-7191
MOBILE	EMERGENLY PLAN/ PICKUP	POISON CONTROL IN MARIN or CA 800-222-1222
FMAIL		SOCIAL MEDIA, FIRE INFO @marinsheriff, @marincountyfire
	LOCAL CONTACTS	YOUR LOCAL AGENCIES (SOCIAL MEDIA)
OTHER # OF SOCIAL MEDIA	NAME	
	ADDRESS	LOCAL RADIO AM 740, AM 810, FM 106.9, FM 88.5;
NAME		West Marin: FM 90.5 Point Reyes, FM 89.9 Bolinas.
MOBILE	PHONE	PHYSICIAN
EMAIL	EMAIL	PEDIATRICIAN
OTHER # or SOCIAL MEDIA		VETERINARIAN
	NAME	INSURANCE
NAME	ADDRESS	HOMEOWNER/RENTER POLICY
MOBILE		
FMAIL		AUTO POLICY
	PHUNE	MEDICAL POLICY 1
OTHER # OF JOCIAL MEDIA	EMAIL	MEDICAL POLICY 2

WILDFIRE & EMERGENCY "GO KIT"

Put together an emergency supply kit in advance for each family member and keep it easily accessible. Plan to be away from your home for an extended period of time. Each person should have their own Go Kit. Store kits in backpacks.

- Bandana, N95 respirator, goggles, leather gloves, long shirt and pants (cotton or wool), boots, hat
- □ Flashlight and headlamp with spare batteries

Wildfire Evacuation Checklist and Family Communication Plan (2019-07-17)

Extra car keys, credit cards, cash

□ Map marked with two evacuation routes (if possible)

- Prescription medications
- Extra eyeglasses or contact lenses □ First aid kit
- Battery-powered radio and extra batteries
- Copies of important docs (birth certificates, passports, insurance policies, etc.)
- □ Pet food and water, leashes, pet supplies and medications

- □ Water bottles and food
- □ Sanitation supplies
- □ Change of clothing
- Spare chargers for cell phones, laptops, etc.

Items to take only if time allows:

- Easily carried valuables
- Family photos, small heirlooms, and other irreplaceable items
- Personal computer data and digital information backups on hard drives and/or disks

FIRESafe MARIN | www.firesafemarin.org



Office of Emergency Services CITY MANAGER

Low Cost/No Cost Emergency Preparedness

- 1. Get a family out-of-state phone contact and make a wallet card for each family member.
- 2. Ensure that school emergency contact cards are regularly updated; ensure that each child has at least 2 people listed to pick him/her up if parents are unavailable.
- 3. Select two family reunification points for use if the house is inaccessible. Select one place in the neighborhood, such as a friend's home, food store, or other location well known to all family members. Select another location not in your immediate neighborhood, but easily accessible by all family members, such as your place of worship, a movie theater or a regional mall.
- Locate your gas meter and learn how to use the gas shut-off valve and <u>when</u> to shut off your gas.
- Store heavy objects on low shelves or on closet floors, not on high shelves. Heavy pots and pans and storage boxes may fall during earthquakes and injure family members.
- 6. Remove any heavy objects from overhead shelves in bedrooms. When people are asleep, they cannot protect themselves from falling objects.
- 7. Water is a most important element. Each person needs one (1) gallon for drinking and food preparation each day. Additional water is needed for sanitation, clean up, and for pets. A dog will also need one (1) gallon a day and a cat will need at least a pint.

Storing water is easy. Wash and rinse clean, 2-liter soda or any other <u>clear plastic</u> juice bottles, fill them with tap water then add four (4) drops of liquid <u>chlorine bleach</u> (Clorox), the plain unscented type.

Do not use the frosted type of plastic jugs that we buy milk and water in for storage purposes. These are for **short time** use and will deteriorate too soon for storage use.

Keep some coffee filters available to be able to filter any cloudy or murky water you obtain during an emergency. Then treat it with sixteen (16) drops of Chlorine Bleach mix well and let stand for at least thirty (30) minutes before using.

A little Tang or Kool-Aid can be added at the time of drinking to avoid the slight bleach taste.

(OVER)

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855 North San Pedro Street, #404 San José, CA 95110-1718 tel (408) 277-4595 www.ci.san-jose.ca.us

83

8. Make a GoKit Document Cache:

- Copies of the tax bill, mortgage papers or property deed to prove homeownership; copy of lease to prove legal right to alternate shelter.
- Copies of 2 utility bills less than 1 year old to prove residency (owners and renters)
- Copies of the credit card list and emergency numbers to report lost cards
- Copies of all family drivers' licenses and auto registrations
- Copies of all Social Security Cards
- A copy of the wills for each family member. Make sure that an out of area family member has another copy in a safe place, and that your legal adviser has a copy.
 Copies of funeral arrangements in place or last wishes for adults.



- **9.** Car Kit Have some simple things in your car. Think about yourself and family members.
 - Water, some snack food, any required prescription medication, and any special needs for your children.
 - Hat, jacket, blanket or shawl. You may need to keep warm.
 - Writing paper, several pencils, a flashlight, (keep the batteries **out** of the flashlight until you need it. This prevents corrosion of the flashlight.
 - Shoes you can walk some distance in. Ladies should avoid "heels, open toes, and sandals.
 - Simple personal hygiene and items for your comfort.

Water, **Food**, and **Medication** should be **changed weekly**. Put a fresh supply into the kit and use what you take out. You do not have to buy extra and nothing spoils. Flashlight batteries should be replaced and used every few months.

Shoes and **extra clothes** need not be new. Those that are out of style, may need a little sew-up, or have a stain, will work just fine in an emergency.

Start small. Then build as you can. Begin, the rest is easy.



PROFESSIONAL DRIVE-AWAY KIT

FOR ERG STAFF

Note: this is in ADDITION TO your personal car kit, which should be brought along.

CRITICAL PERSONAL PREPAREDNESS:

- Adequate supply of drinking water for 5 days (1 gallon/person/day recommended)
- Adequate supply of prescription and OTC medications for at least 10 days, or the duration of the assignment, whichever is greater

Personal supplies:

- eye glasses prescription (reading, computer, sun glasses, other), spare pair, repair kit
- hearing aid and batteries
- baby wipes, hand sanitizer
- deodorant, tooth brush, toothpaste
- t-shirts, underwear and socks
- Sweats and socks for sleeping
- cot, pillow, sleeping bag, blanket
- towel, wash cloth, soap
- trash bags, toilet paper, small shovel
- other personal support items for austere circumstances

Communications equipment: Note- cell phones should allow use while recharging

- □ GETS card
- WPS card
- Cell phone
 - o car charger
 - wall charger
 - solar charger
 - spare battery
 - Solar/crank radio
- ☐ Solar/c
 ☐ Radio
 - \circ car charger
 - wall charger
 - solar charger
 - spare battery
- □ Satellite phone
 - car charger
 - wall charger
 - o solar charger
 - spare battery

Note: getting equipment that uses a USB connection for charging can limit the number of chargers needed.

Computer equipment:

- □ Laptop
 - o car charger
 - wall charger
 - o solar charger
 - spare batteries
- Thumb drive Π Π
 - Digital camera
 - o car charger
 - wall charger
 - solar charger
 - spare batteries
- Small portable printer
 - cables to connect to various computers
 - o paper
 - spare cartridges
- Tablet computer, PDA, SMART Phone or other small computer Π
 - o car charger
 - o wall charger
 - solar charger
 - spare batteries
- Note: getting equipment that uses a USB connection for charging can limit the number of chargers needed.
- AC extension cord with at least 3 plug-in slots
- Appropriate software for each computer
 - Internet connection
 - Office Suite (Word, Excel, others) 0
 - GPS 0
 - o GIS
 - CAD
- Program files to support the ERG work
 - Maps
 - o As-builts
 - Plans
 - Directories department phone list, relevant contracts contacts
 - Forms, regulations, other essential documents 0

Paper copies of relevant plans and maps

- District Emergency Operations Plan Π
- District COOP/COG Plan Π
- Π ERG Fan-out chart
- Area maps, including maps to alternate COOP/COG sites Π
- Maps of critical facilities in the district
- District employee phone lists
- District employee emergency contact lists Π
- ☐ Air, rail and transit electronic contact information

Office Supplies for Austere Conditions

- Pens, pencils, sharpener, eraser Π
- Scissors, string, twine
- Portfolio or clipboard and spare paper pads
- Π Laptop desk or small folding table and chair
- Π Paper clips, binder clips, magnetic clips
- Scotch tape, electrical tape, package tape, duct tape Π
- Stapler and staples Π

School/Child Day Care Emergency Plans Adult Day Care Emergency Plans

Some State DOT employees may have dependent children or dependent older adults in their households. These employees need to plan in advance for participation in State DOT emergency response activities, including deployment to the alternate continuity site if assigned.

To avoid stress for the employee and the dependent at the time of an emergency steps should be taken now to clarify how the dependent will be cared for during a disaster.

Know your children's school / day care emergency plan:

- Ask how the school/day care will communicate with families during a crisis. Is there an
 automated phone dialing system to contact your work, cell, or home phone? Is there a
 radio station that you should monitor for information from the school or district?
- Ask if the school/day care stores adequate food, water, and other basic supplies. Work
 with other parents to ensure that there is an adequate stockpile of water and medical
 supplies at the school. Suggest that each child bring a backpack of personal support food,
 clothing, and a family photo to store at the school/day care each school year. At the end
 of the year the students can use the food and water for a picnic or donate the food and
 water to a shelter.
- Ask how long children will be supervised at the school/day care if you are delayed in
 picking up a child in a disaster. For example, in California teachers must stay until the
 last child is released, or until the principal combines remaining classes of children under
 the supervision of a teacher. Day care, however, has no such requirement. Who on the
 staff is committed to staying with children until authorized caregivers pick them up?
- Find out if the school/day care is prepared to shelter-in-place if need be, and where they
 plan to go if they must get away. How will the children be transported and who will be
 responsible for them?
- Ensure that you know the school/day care's emergency release policy. Keep the
 emergency release card up to date with the names of family members, friends, and
 neighbors who are authorized to take the child from school during an emergency.
 - Be sure to include any court-ordered protective orders to prevent inappropriate relatives – including a non-custodial parent – from picking up the child.
 - Remember that only those on the emergency card will be allowed to take the child from school or day care, so ensure that there are adequate numbers of authorized caregivers.

- Ensure that these caregivers are aware that they may be picking up the child in an emergency. Be sure the authorized caregivers have each other's names, addresses, and contact information.
- Know the location of pick-up and what documentation will be required for the child's release: driver's license, other photo identification, or child's consent?

Know your adult dependent's day care or nursing home facility emergency plan:

- Ask how the day care or nursing home will communicate with families during a crisis. Is
 there an automated phone dialing system to contact your work, cell, or home phone? Is
 there a radio station that you should monitor for information from the facility?
- Ask if the facility stores adequate food, water, and other basic supplies. Work with other
 responsible caregivers to ensure that there is an adequate stockpile of water and medical
 supplies at the facility. For day care, suggest that each client bring a backpack of personal
 support food, clothing, and a family photo to store at the facility each school year. At the
 end of the year the clients can use the food and water for a picnic, or donate the food and
 water to a shelter.
- Ask how long clients will be supervised at the day care or nursing home if you are
 delayed in picking up a dependent adult in a disaster. Few adult day care facilities have
 legal mandates to stay at the facility. Nursing homes have contracts that should include
 continuous care, but check carefully to know exactly who will be staying at the nursing
 home until all clients are picked up and what alternate sites may be used for the care of
 the last few clients. Some nursing homes have mutual aid agreements, so be sure to know
 where your dependent might be sent.
- Find out if the facility is prepared to shelter-in-place if need be, and where they plan to go
 if they must get away. How will they be transported? How will their medical records,
 medical supplies, and pharmaceuticals be safeguarded if they are moved?
- Ensure that you know the facility's emergency release policy. Keep the emergency
 release card up to date with the names of family members, friends, and neighbors who are
 authorized to take the client from day care or the nursing home during an emergency.
 - Be sure to include any court-ordered protective orders to prevent inappropriate relatives – including a non-custodial spouse or children – from picking up the client.
 - Remember that only those on the emergency card will be allowed to take the client from school, so ensure that there are adequate numbers of authorized caregivers.
 - Ensure that these caregivers are aware that they may be picking up the client in an emergency. Be sure the authorized care givers have each other's names, addresses, and contact information.
 - Know the location of pickup and what documentation will be required for the client's release: driver's license, other photo identification, or client's consent?

SPRING AHEAD!

SPRING AND FALL JOBS:

IMPORTANT STEPS TO TAKE WHEN YOU CHANGE THE CLOCKS!

- 1. <u>Change the batteries in your smoke detectors.</u> Save the batteries for re-use in handheld electronic devices and toys. Recycle used batteries through the County's Household Hazardous Waste Program: 408-299-7300.
- 2. <u>Change all the batteries in your emergency supply kits and your household flashlights.</u> Follow the same reuse and recycle steps as in #1.
- 3. <u>Rotate the food, water and non-prescription medications in your car kit, desk kit and house-hold caches.</u> Use the previously stored food within the next few weeks. Ensure that the newly stored food is recently purchased and has at least nine months left on the "use by" date noted on the container. Discard medications from the car kit, and put desk kit items in the front of the medicine chest for first use.
- 4. <u>Check your gas shut off valve.</u> Turn the valve 1/8th of a turn in each direction to ensure that the valve moves freely. If the valve does not move readily, call PG&E for a free valve service and lubrication. THIS IS NOT A DO-IT-YOURSELF JOB!
- 5. Sort through the supplies stored under your kitchen sink and in the laundry cupboard. Ensure that you keep all liquid cleaning products containing "chlorine" or "bleach" in the laundry, and all liquid products containing "ammonia" in the kitchen. If you have children in the home ensure that these cupboards are protected with properly installed and working safety latches to prevent child poisoning.
- 6. Sort through the toxics stored in your garage. If you find items that you no longer need, properly recycle or discard those items in their original containers through the County's Household Hazardous Waste Program: 408-299-7300. Ensure that the items you keep are segregated by category and properly stored in waterproof containers with lids, and with locks if you have children in your household. Sort into paint <u>and</u> painting supplies; gardening fertilizers and pesticides; automotive products; and hobby supplies. Store the lidded containers on the garage flood or behind locked cupboard doors.
- 7. <u>Review the medical information in your Vial of Life and with your child's caregiver.</u> Update the information to add or change medical conditions, medications and dosages, doctors' names and phone numbers, and emergency contact information.

These seven steps taken every six months will ensure that you are ready for emergencies!

FALL BACK!

FIRES, FLOODS, FAULTS, TERRORISTS...

DO YOU KNOW WHERE YOUR

EMERGENCY INFORMATION IS...?

During a disaster, like an earthquake or flood, you may need to evacuate your home rapidly. You will want to have some important legal documents with you, and others in a safe place. Take steps now to ensure that you safeguard your legal documents, and have appropriate access to them for disaster recovery!

1. Open a bank safe deposit box, or buy a fireproof safe for essential, irreplaceable, original documents. These include:

- Family birth certificates
- □ Marriage certificates and divorce papers
- Citizenship papers
- Military records and discharge papers, copies of the face of military ID cards
- Copies of insurance policies with agent contact information
- A list of bank accounts with the bank address
- A list of credit card numbers and addresses
- Accountant's copy of your income tax filings for 7 years
- Securities, US Savings Bonds, certificates of deposit, etc.
- Original Social Security Cards for all family members
- □ Titles and deeds for property
- □ Vehicle titles and a copy of the registration papers

2. Make a GoKit Document Cache to keep in your family emergency kit. Organize these records in a 1" ring binder with page protectors, or in a waterproof container. You can use a 14" piece of 3" PVC pipe and two end caps. Use adhesive to attach one end cap permanently, and use a threaded cap for the other end. Fill the book or tube with the following documents/copies and update it each spring and fall.

- Copies of birth certificates and marriage/divorce papers
- Emergency contact information for all family members: work address and phone, school address and phone, day care/after school care address and phone
- Out of area contact person's name, address and phone number
- Copies of citizenship papers/green cards
- Original passports for all family members
- Military papers to prove Veterans Benefits eligibility, copies of the face of military ID cards
- Copies of medical information for each family member: physicians names and numbers, prescription drug names and dosages, pharmacy name and number
- Copies of insurance policies with 24-hour contact information for every policy
- Copies of the tax bill, mortgage papers or property deed to prove homeownership; copy of lease to prove legal right to alternate shelter
- Copies of 2 utility bills less than 1 year old to prove residency (owners and renters)
- Copies of the credit card list and emergency numbers to report lost cards
- Copies of all family drivers' licenses and auto registrations
- Copies of all Social Security Cards

- 91 One pad of checks and one credit card for an account that you seldom use. Use for emergency expenses: food, alternate lodging, replacement clothing
- □ \$50 in small bills in case cash registers and credit card machines do not work
- □ \$10 in quarters for the pay phone
- A copy of the wills for each family member. Make sure that an out of area family member has another copy in a safe place, and that your legal adviser has a copy.
- Copies of funeral arrangements in place or last wishes for adults.

DON'T LEAVE YOUR FAMILY'S FINANCIAL SECURITY TO CHANCE...BE PREPARED!

ATTACHMENT 4: PIO CHECKLISTS



This document was created as part of the Election Infrastructure Government Coordinating Council and Subsector Coordinating Council's Joint Mis/Disinformation Working Group. This document is intended to be used by state, local, tribal, and territorial election officials and industry partners as part of a larger mis-, dis-, and malinformation (MDM) response strategy.



RUMOR CONTROL PAGE START-UP GUIDE

Misinformation, disinformation, and malinformation (MDM) can present risks to the election infrastructure community, its owners and operators, and the public. MDM can spread quickly, causing rumors to undermine facts.



The risks of MDM range from undermining confidence in institutions to activating and inspiring dangerous behaviors and violence.

This Rumor Control Page Start-Up Guide is for organizations seeking to dispel specific MDM narratives through transparent and authoritative information. Designed for use by state, local, tribal, and territorial (SLTT) government officials and private sector partners, this guide cites the Cybersecurity and Infrastructure Security Agency's (CISA) Rumor Control page as a model for debunking inaccurate narratives. The recommendations in this guide are not intended to be one-size-fits-all and should be adapted to the capabilities and resources available, as well as the MDM risks facing the community. Organization should only set up a rumor control webpage related to issues for which they have access to information and expertise necessary to properly dispel MDM narratives and articulate facts. Each organization that plans to set up a rumor control page may want to consult with the appropriate organization legal counsel, if possible, prior to beginning operations.

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What is a rumor control page?

A <u>rumor control page</u> is a web page that offers the public accurate and authoritative sources of information which will help address common MDM narratives. It is provided by a trusted voice to either preempt or respond to developing narratives. Credible messengers are most effective at disproving falsehoods. A rumor control page should not be considered the sole source of truth, rather it should drive people to seek more information about a complex subject by directing them to other trustworthy sources.

With a rumor control page, election officials and stakeholders can dispel rumors about the systems and assets they manage and have unique insight into. Some election offices may already have public information websites, which commonly include a "Frequently Asked Questions" page and/or press releases that seek to clarify information. In this sense, a rumor control page can be viewed as an extension of existing efforts.

It is important to note that a rumor control page is only one element of a successful MDM response strategy. Improving the resilience of elections to MDM also requires reporting MDM narratives. The Center for Internet Security (CIS) was established to support the cybersecurity needs of the election subsector. The CIS can be leveraged to report real-time MDM via email at misinformation@cisecurity.org. Be sure to include links and screenshots, as well as details on the misinformation and your jurisdiction.

How can a rumor control page reduce risk of MDM?

A rumor control page is a public resource for authoritative information. By providing people with accurate, timely information, the page can help slow the dissemination and amplification of MDM narratives and reduce your organization's risk. It also provides an authoritative source for others to cite to amplify accurate information, including via internet searches.



When should you use rumor control?

A rumor control page provides reasonable, authoritative information that refutes claims that develop via MDM narratives. MDM narratives often emerge where there is a lack of information or where not all information is known (as in a breaking news story). Effective narratives appeal to one's sense of identity and community belonging (or the desire to belong), and shortcut rational processes through invoking an emotional response, like shock, fear, or excitement.

At this point of interest, consumers may seek more information to either confirm or refute what they have read, and a rumor control page fills the void by providing accurate information from a trusted local source. When presented with this information, consumers are less likely to amplify an MDM narrative.

Above all, use caution when deciding what rumors to include on your page. Before developing a response, consider whether any of the following factors are at play to determine the best path forward:

- Is the content of the rumor within your sphere of influence to address? Consider if you are best
 positioned to respond to the narrative, or if another entity would have more authority or expertise,
 such as your technical systems provider. In some instances, a joint response may also be
 appropriate.
- How prevalent is the rumor? To the extent you are allowed by law, determine the spread of the
 narrative across different social media platforms and/or whether it has been picked up by traditional
 media outlets. If the spread is minimal, consider whether responding to it will amplify the rumor
 instead of combating it.
- Are you confident your response is accurate and contains appropriate caveats? For example, rumors involving breaking news stories may need a caveat that updates will be made once more information is known. Where you do not have sufficient expertise, reference the trusted sources and experts you consulted in crafting your response.
- Does the content of the rumor involve matters currently in litigation? If so, consult with your office's attorney before proceeding with a response.

Not all rumors and MDM narratives have to be addressed. Deciding which rumors should be addressed is an exercise of an organization's judgement — and that judgement may change as MDM narratives evolve.

A sample checklist on page 5 outlines criteria that may help you determine if a rumor control entry is appropriate.

🖄 How do you communicate effectively on a rumor control page?



First, even when there are no specific narratives for you to counter, consider common questions those in your community have about elections and election-related processes and answer those on your rumor control page. You should also anticipate complex or difficult-to-understand characteristics of your operation may be targets for MDM narratives. Proactive communications and engagement will help build trust in your office as an authoritative source of information and make it more likely that consumers will return to your page when MDM narratives emerge.

When MDM narratives emerge, a standard format should be used to explain why each rumor is inaccurate or misleading. The rumor control page entry should provide a factual statement, summarize the rumor in one sentence, and provide a substantial explanation debunking the rumor.

- Begin with the facts: Debunking or mitigating MDM reduces belief in the narrative at hand, according
 to the <u>Virality Project</u>. Presenting factual information first is the best strategy for combating MDM, as
 starting with the rumor can unintentionally amplify an MDM narrative and confuse or mislead your
 audience.
- Use plain language: It is critical the information used to debunk MDM narratives is easily understood by the average person. Content should be simple and straightforward, with links to further resources where appropriate. Where possible, include images and diagrams in social media posts (including ones developed by other sources if your resources are limited).
- Provide other sources: You should provide links to sources that are recognized as independent and reliable.





How should you document the decision to include a rumor on your page?

Record your decision-making process for each rumor. This assessment will inform future decisions as your organization works to fight MDM.

- What considerations informed your decision to address or not address the rumor?
- What were the potential consequences of the spread of this MDM narrative?
- Was the rumor "ripe for intervention" based on the timeliness of the situation, the potential spread of the MDM narrative, and the consequences of its spread?



How should you handle inflammatory or sensitive rumors?

Reporting MDM activity helps the election community combat emerging MDM narratives. MDM narratives that contain sensitive or leaked information, call for violence, or pose an imminent threat of physical harm should be directed to local law enforcement. These narratives may also be reported to federal law enforcement, like your Election Crimes Coordinators. A rumor control page is not intended to address these sorts of MDM narratives.



Rumor Control Checklist

Consider the checklist on the next page before making your decision on which rumors should be addressed. Note that the decision of how, when, and where to respond will always be context- and content-specific and there is no firm threshold for response. Nonetheless, if you answer "Yes" to a majority of these criteria, then you should discuss moving forward with dispelling the rumor. Add your own criteria to the list as well. By creating a selection process for rumors to be featured on your page, your organization can quickly respond to and disrupt MDM narratives.

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ASSESSMENT		
My organization has the expertise and mission set to distinguish the narrative from good faith discourse.	Yes	No
My organization has the expertise and responsibility to clearly and appropriately dispel the false narrative and articulate the facts.	Yes	No
The narrative is around a contentious or disputed topic, where information is changing or not widely known.	Yes	No
The narrative pertains to systems, information, processes, or expertise that is operated by or unique to my organization.	Yes	No
TRENDS		
The MDM narrative is trending on social media.	Yes	No
The narrative is spreading on multiple platforms.	Yes	No
Traditional media is reporting on the narrative/artifact. (Traditional media comprises broadcast and print media at the national, state, and/or local level. This may include the major networks, newspapers, journals, and online.)	Yes	No
Multiple narratives/artifacts are converging into a single narrative or conspiracy.	Yes	No
AMPLIFICATION		
Multiple organizations across the sector are reporting similar narratives/artifacts.	Yes	No
The allegation is paired with media (pictures, video, audio) that is unverified or misrepresented, in an effort to provide "legitimacy" to the narrative.	Yes	No
There is an opportunity to amplify corrections initiated by social media platforms and/or traditional media.	Yes	No
CONSEQUENCES		
The narrative includes a call to arms* or other directions for action, whether in person or virtual.	Yes	No
The narrative/artifact focuses on upcoming major milestones or events where early fact-checking could proactively disrupt the spread.	Yes	No
The rumor could cause physical or reputational damage to the organization, community, country, or global society.	Yes	No

*MDM Narratives that contain sensitive or leaked information, calls for violence, or poses an immediate threat of physical harm should be directed to local law enforcement, reported to your Election Crimes Coordinator, and reported to any other entity required under the law. This document is provided as guidance only. Organizations should consult with their election officials, legal counsel, and other required entities within their jurisdiction before starting a rumor control program. This guide does not provide your organization with the legal authority to operate a rumor control page if it's not allowed/authorized by your SLTT laws.

Public Information Officer Position Checklist

The following checklist should be considered as the minimum requirements for this position. Note that some of the tasks are one-time actions; others are ongoing or repetitive for the duration of the incident.

\checkmark	<u>Task</u>
1.	Obtain briefing from Incident Commander:
	 Determine current status of Incident (ICS Form 209 or equivalent).
	 Identify current organization (ICS Forms 201 and 203, resource lists, etc.).
	 Determine point of contact for media (scene or Command Post).
	Determine current media presence.
2.	Participate in Administrative Officer's briefing:
	 Determine constraints on information process.
	 Determine pre-existing agreements for information centers, Joint Information Centers (JICs), etc.
3.	Assess need for special alert and warning efforts, including the hearing impaired, non- English speaking populations, and industries especially at risk for a specific hazard, or which may need advance notice in order to shut down processes.
4.	Coordinate the development of door-to-door protective action statements with Operations.
5.	Prepare initial information summary as soon as possible after activation. If no other information is available, consider the use of the following general statement:
	Sample Initial Information Summary

We are aware that an [accident/incident] involving [type of incident] occurred at approximately [time], in the vicinity of [general location]. [Agency personnel] are responding, and we will have additional information available as we are able to confirm it. We will hold a briefing at [location], and will notify the press at least 1/2 hour prior to the briefing. At this time, this briefing is the only place where officials authorized to speak about the incident and confirmed information will be available. Thank you for your assistance.

1

02/10/12
Public Information Officer Position Checklist

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 Arrange for necessary work space, materials, telephones, and staff. Consider assigning Assistant Public Information Officers to:
 Joint Information Center (JIC).
Field (scene) Information.
Internal Information.
7. Establish contact with local and national media representatives, as appropriate.
8. Establish location of Information Center for media and public away from Command Post.
9. Establish schedule for news briefings.
 Coordinate, with Logistics, the activation and staffing of message center "rumor control" lines to receive requests and answer questions from the public. Provide statement to operators.
11. Obtain current incident status reports from Planning Section; coordinate a schedule for updates.
12. Observe constraints on the release of information imposed by the Incident Commander and according to agency guidance.
13. Obtain approval for information release from Incident Commander:
 Confirm details to ensure no conflicting information is released.
 Identify site and time for press briefings, and confirm participation by other Incident Management Team (IMT) members.
 Release news to media, and post information in Command Post and other appropriate locations.
15. Record all interviews and copy all news releases:

 Contact media to correct erroneous or misleading information being provided to the public via the media.

02/10/12

2

Public Information Officer Position Checklist

02/10/12

16. Upd	late off-incident agency personnel on a regular	basis:		
• U	tilize electronic mail for agency updates.			
• E u	stablish phone line in the Command Post dedic pdate agency personnel.	ated to internal communications to		
• P	rovide standard statement which can be given	to general requests for information.		
17. Coordinate information releases with information staff from other impacted agencies and jurisdictions:				
• E b	insure that information provided to the public is oundaries, when appropriate.	consistent across jurisdictional		
18. Atte	end Planning Meetings:			
Sample Planning Meeting Agenda				
	Agenda Item	Responsible Party		
1 2 3 4 5 6 7 8 9 10 11 12 13	Briefing on situation/resource status. Discuss safety issues. Set/confirm incident objectives. Plot control lines & Division boundaries. Specify tactics for each Division/Group. Specify resources needed for each Division/Group. Specify facilities and reporting locations. Develop resource order. Consider communications/medical/ transportation plans. Provide financial update. Discuss interagency liaison issues. Discuss information issues. Finalize/approve/implement plan.	Planning/Operations Section Chiefs Safety Officer Incident Commander Operations Section Chief Operations Section Chief Operations/Planning Section Chiefs Operations/Planning/Logistics Section Chiefs Logistics Section Chief Logistics/Planning Section Chiefs Finance/Administration Section Chief Liaison Officer Public Information Officer Incident Commander/All		
19. Res	pond to special requests for information.			
20. Provide all news releases, bulletins, and summaries to Documentation Unit to be included in the final incident package.				
21. Con dea	firm the process for the release of information ths.	concerning incident-related injuries or		
22. Doc	ument all activity on Unit Log (ICS Form 214).			

3

EOC PUBLIC INFORMATION BRANCH

Responsibilities

- Provide updated status reports on AGENCY services such as bus, light rail, paratransit, commuter shuttles, and congestion management to the public and public agencies.
- Local print and electronic media will play a crucial role in the dissemination of public information, so early and regular contact is essential.
- Social media outlets will be the primary source of information for many community members, so establishment and maintenance of Facebook, Twitter, Nextdoor and Instagram accounts is essential, and other outlets may also be needed based on community preferences.
- Make pre-disaster contacts with community social media influencers, and establish relationships with them for early support for community emergency information communication.
- Manage AGENCY social media platforms to receive information from the public and send information to the public. Be especially conscious of multiple language social media outlets, and use bi-lingual city staff to provide written and oral information, and to receive and process information from the public.
- Radio Amateurs in Civil Emergency Services (RACES) may be requested through mutual aid from the Op Area EOC.

CONCEPT OF OPERATIONS

The designated Public Information Officer (PIO) for the EOC is the AGENCY Public Information Officer. In this capacity, the PIO will be supported by other public outreach professionals from within AGENCY. Through delegation of authority, designated individuals may also act as PIO on other shifts if the EOC is open for prolonged periods, or in the event that the PIO is unable to serve.

Media representatives and government agencies should be advised that the single official point of contact for the media during an emergency is the PIO.

Agreements with the information media relative to the dissemination of emergency public information should be negotiated and finalized, pre-event, if possible. Generally, emergency public information will be disseminated through the press, radio, and television, and through social media, as appropriate. A media center will be designated by the PIO, and media briefings about AGENCY services will be conducted by the PIO at this location on a regular basis.

In a multi-agency event, a Joint Information Center (JIC) may be designated by the Op Area, or a state or federal agency, for the dissemination of disaster event intelligence. AGENCY will be represented at the JIC.

COMMUNICATIONS

Circumstances permitting, the PIO should arrange for public information telephone access as follows in office space near the EOC:

- Minimum of three lines in a hunt group for media inquiry
- Minimum of one outgoing, unlisted line, not in rotary, for exclusive use of the PIO

In the event telephone service is not available, amateur radio (RACES) volunteers may be requested to support the PIO in dissemination of emergency public information.

DUTIES AND RESPONSIBILITIES

Duties and responsibilities of the PIO include,

- In coordination with the EOC Coordinator and AGENCY departments, prepare in advance emergency public information materials that address AGENCY's emergency operations for all hazards; and translate these materials into appropriate languages; and arrange for sign language interpretation for television press conferences and social media video feeds.
 - Provide a field PIO when the AGENCY is Incident Commander, and ensure that only the Field PIO speaks with the media in the field. Coordinate EOC PIO and Field PIO releases.
 - Ensure that messages on the AGENCY Helpline and social media sites are kept accurate and up-to-date.
 - Plan for the use of IPAWS and WEA systems to disseminate emergency information. Coordinate with the county or other authorized IPAWS and WEA outlet.
- Prepare instructions for people who must evacuate from AGENCY facilities and vehicles in high-risk areas.
- Prepare evacuation guides for use by communities using AGENCY vehicles for evacuation, including the quantity of baggage that each person may bring on an AGENCY evacuation vehicle, preparation of pets to travel on AGENCY vehicles (carriers, leashes), managing baby carriers/strollers on evacuation vehicles, considerations for people with limited mobility in using AGENCY evacuation vehicles, and guidance for people with other special needs.
- Establish a rumor control procedure in collaboration with the Planning/Intelligence Section's Situation Status Branch, including monitoring radio and television stations and social media outlets carrying coverage of the event. The PIO will issue all media releases, including requests to correct inaccurate information.

MEDIA ACCESS

Access to disaster areas by accredited reporters is guaranteed, with certain exceptions, by the California Penal Code. The California Peace Officers Association suggests, "In general, authorized members of the news media are to be permitted free movement in the area as long as they do not hamper, deter, or interfere with the law enforcement or public safety functions." If access restrictions for the media are unavoidable, a pool system may be established. Under this system, a representative of each medium would be selected and escorted into the restricted area. Information, photos, and film footage must then be shared with other media representatives.

Public Information Officer (PIO)

Responsibilities

- 1. Serve as the coordination point for all media releases for AGENCY. Represent AGENCY as the lead Public Information Officer.
- 2. Ensure that the public, especially the traveling public within the affected area, receives complete, accurate, and consistent information about access to AGENCY services, evacuation vehicles/routes, transportation services for people with functional needs, and other vital AGENCY information, using media, website, social media, e-mail lists and other available resources.
- 3. Keep the AGENCY Helpline and social media outlets information accurate and up-to-date.
- 4. Coordinate media releases with the Management Section Chief and with PIOs representing other affected emergency response agencies, such as affected local government PIOs.
- 5. Develop the format for media conferences in conjunction with the MANAGEMENT SECTION CHIEF.
- 6. Maintain a positive relationship with media representatives.
- 7. Supervise the Public Information Branch.
- 8. Maintain phone contact list for the PIO staff for emergency contacts.

Activation

- Report to the EOC and follow the Generic Action Checklist
- Determine staffing requirements and make required personnel assignments for the Public Information Branch, as necessary.
- Make needed changes to the Customer Information Line and website to ensure that it is accurate and up-to-date with disaster developments.

Emergency Response

- Obtain policy guidance from the MANAGEMENT SECTION CHIEF with regard to media releases. Ensure that all media releases are signed by the MANAGEMENT SECTION CHIEF before release, and that the Customer Information Line (2300), social media outlets and websites are up-dated with the news release information.
- Keep the MANAGEMENT SECTION CHIEF advised of all unusual requests for information, and of all major critical or unfavorable media comments. Recommend procedures or measures to improve media relations.
- Provide appropriate staffing, telephones, e-mail accounts, and social media connections to efficiently handle incoming media and public calls.
- In coordination with other EOC sections and as approved by the MANAGEMENT SECTION CHIEF, issue timely and consistent advisories and instructions for assistance to the public through the media, AGENCY webpages, AGENCY social media and any other reputable outlets that may be available.

- Establish workflow with the Planning/Intelligence Situation Status Branch/Rumor Control and identify methods for obtaining and verifying significant information as it is developed.
- Ensure that a rumor control function is established in the Planning/Intelligence Situation Status Unit to correct false or erroneous information quickly, including monitoring media and social media coverage of the event.
- Ensure that adequate staff is available at incident sites, especially high visibility locations, to coordinate with the media.
- Establish a media information center, ensuring that there are necessary space, materials, telephones, and electrical power.
- Develop and publish a media-briefing schedule for the MANAGEMENT SECTION CHIEF, including location, format, and preparation and distribution of handout materials.
- Create and update social media communications regarding the incident, and maintain two-way communication with social media site users.
- Implement and maintain an overall information release program, including the use of IPAWS and WEA as appropriate.
- Maintain up-to-date status boards and other references at the media information center. Provide adequate staff to answer questions from members of the media and to monitor and interact with social media.
- Interact with the Op Area EOC PIOs, and obtain information relative to public information operations.
- Develop content for Emergency Alert System (EAS) releases if available. Monitor EAS releases.
- Coordinate with the City Manager's Office staff to ensure that they have accurate information to share with the GOVERNING BODY regarding the AGENCY's role in the emergency situation.
- At the request of the MANAGEMENT SECTION CHIEF, prepare media briefings for members of the Policy Group, and provide other assistance as necessary to facilitate their participation in media briefings and press conferences.
- Ensure that adequate staff is available to conduct briefings and tours with media of the AGENCY resources in the disaster area, if safe.
- Prepare, update, and distribute to the public via the media, the AGENCY website, social media and other appropriate means, information on evacuation routes and operating transit routes serving the impact area.
- Ensure that announcements, emergency information and materials are translated and prepared for vulnerable populations, including non-English speakers, and people with access and functional needs, especially those with sight and hearing limitations.
- Coordinate with the Rumor Control Unit in the Planning/Intelligence Section to monitor broadcast media and social media, using information to develop follow-up news releases and rumor control.
- Ensure that file copies are maintained of all information released.
- Ensure that the MANAGEMENT SECTION CHIEF has an up-to-date file of all media releases.
- Conduct shift change briefings for in-coming PIOs in detail, ensuring that in-progress activities are identified and follow-up requirements are known.

Demobilization

- At EOC close-out, prepare final news releases and advise media representatives of point-of-contact within AGENCY for follow-up stories. Revise the Customer Information Line (2300), website and social media information
- to reflect current conditions.
- Follow generic Demobilization Phase Checklist.

SAMPLE PRE-MADE MESSAGES

RESPONSE TO A MAJOR EARTHQUAKE

UPDATE ON EARTHQUAKE

This is	at the A	AGENCY Emergency Operations Center. The mag-
nitude of the earthquake, which stru	ck the	area at
today, has been determined to be		on the Richter scale. The epicenter has been
fixed at b	у	
	(scien	tific authority)
AGENCY has received reports of		damage to the [AGENCY infrastructure]. A list of

route closures may be found at the AGENCY website, or heard by calling the AGENCY Hotline at ______. AGENCY personnel are on the scene to evaluate the damage and begin emergency repairs. (Continue with summary of situation.)

Aftershocks continue to be felt in the area. If you feel shaking, drop, cover and hold. Do not use your telephone unless you need emergency help.

RESPONSE TO A MAJOR EARTHQUAKE

SUMMARY STATEMENT FOR MEDIA

At approximately _________ today, an earthquake registering _______ on the Richter scale struck the ________ area, with its epicenter at ________. AGENCY field units were immediately dispatched to assess damage to the AGENCY equipment and infrastructure. A list of route closures may be found on the AGENCY website or heard at the AGENCY Hotline at (phone number) _____.

Significant aftershocks are likely to be felt for days to weeks. Damage may be made worse by each aftershock. AGENCY response personnel are in the field in ______ (name affected communities) to evaluate roadway and trackway conditions and develop emergency restoration plans. Check in with the AGENCY website and social media, or call the Hotline at ______ for more detailed information as the event unfolds.

RESPONSE TO A HAZARDOUS MATERIAL

INCIDENT ON AGENCY

UNIDENTIFIED SPILL/RELEASE IN HEAVY TRAFFIC AREA

This is ______at the AGENCY EOC. An unidentified substance, which may be hazardous, has been spilled/released at _______ (specific location), causing a stoppage of AGENCY services. Please avoid the area, if possible, while crews are responding. The best alternate routes are ______. If you are already in the area, please be patient and follow directions of emergency response personnel. The substance will be evaluated by [Community] Fire Department personnel, and further information will be released as soon as possible. Thank you for your cooperation.

LOW HAZARD/CONFINED SPILL/RELEASE ON AGENCY

NO GENERAL EVACUATION

This is _______ at the AGENCY EOC. A small amount of _______, a hazardous substance, has been (spilled/released) at _______. Streets are blocked, traffic is restricted, and authorities have asked residents in the immediate area to evacuate. Please avoid the area. The material is (slightly/highly) toxic to humans and can cause the following symptoms:

If you think you may have come in contact with this material, you should contact your medical caregiver. For your safety, please avoid the area. Alternate routes are ______ and traffic is being diverted. If you are now near the spill/release area, please follow directions of emergency response personnel. Cleanup crews are on the scene. Thank you for your cooperation.

RESPONSE TO A HAZARDOUS MATERIAL INCIDENT ON AGENCY PROPERTY

SUMMARY STATEMENT FOR MEDIA

(ADAPT FOR SITUATION)

At approximately	_a.m./p.m. today, a (spill/release) te) was reported to AGENCY by mmediately dispatched to cordon	of a potentially hazardous sub- (a citizen, employee, etc.). off the area and direct traf-
fic. The material was later dete	ermined to be a (hazardous or har	mless) (chemical/substance/
material)	whic	h upon contact, may produce
symptoms of		. Precautionary evacuation of
the (immediate or X-block)	area surrou	nding the spill was (requested
or required)	by (Agency)	·
Approximately (number)	persons were evacuated. C	lean-up crews from (agency/
company)	were dispatched to the sce	ene and normal traffic had re-
sumed by (time), at	which time the route was reopene	ed. There were (no injuries
reported / pers	ons, including AGENCY personne	el) treated at area hospitals for
(spe	cific injuries if known) and	were later released.
Those remaining in the hospita	al are in (critical/serious/fair)	condition. Response
agencies involved were AGEN	CY, (others).	·

RUMOR CONTROL UNIT LEADER

Responsibilities:

- 1. Monitor social media and commercial media for confirmed and unconfirmed information and rumors; relay media coverage of the event to the PIO.
- 2. Receive media updates from the PIO
- 3. Open the "Disaster Hotline" (408-321-7550) for AGENCY staff, media and the public, with an up-to-date recorded message. Activate all social media assets and websites, and post current information. Change the messages whenever circumstances change, and update it at least after every Action Planning Briefing. Ensure that the final script for each recorded or posted message is signed by the Management Section Chief.

Activation Phase:

Report to the EOC and follow the Generic Activation Checklist.

Operational Phase:

- Obtain "confirmed" disaster information from the Public Information Officer (PIO), and post only the official releases to social media, websites and other communications outlets.
- Correct rumors by providing factual information based on confirmed data to outlets reporting inaccurate information.
- Inform the PIO of all false rumors and inaccuracies being reported within the community through media, social media and other sources. Try to determine the source of the misinformation and get contact information for that individual or organization for the PIO's use in correcting it.
- Establish a "Disaster Hotline" recorded message and provide updated message information periodically based on the PIO's news releases.
- Use all social media assets to provide accurate information. Monitor social media websites for inaccurate information and correct it immediately.
- □ Notify the PIO when the "Disaster Hotline" should be staffed with operators, based on the need to update a dynamic situation, and when social media needs proactive interaction with the public.
- Refer inquiries from members of the media to the lead PIO or designated staff.

Demobilization Phase:

Follow generic Demobilization Phase Checklist.

109

ACRONYMS AND ABBREVIATIONS

AB 109 Assembly Bill 109 – Prisoner Realignment Act Alert Santa Clara County AlertSCC ARES Amateur Radio Emergency Services ARRL American Radio Relay League BIA Bureau of Indian Affairs BLM Bureau of Land Management Cal Fire California Department of Forestry and Fire Protection CCC California Conservation Corps CDCR California Department of Corrections and Rehabilitation CERT Community Emergency Response Team CNG California National Guard COVID-19 Corona Virus Disease, 2019 CZU A Cal Fire designation for an area that Includes Santa Cruz and San Mateo Counties DHS Department of Homeland Security DoD Department of Defense EAS Emergency Alert System **Emergency Broadcast System** EBS EOC **Emergency Operations Center** FCC Federal Communications Commission FEMA Federal Emergency Management Agency FRA Federal Responsibility Area United State Forest Service, part of USDA FS

110	
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GIS	Geographic Information System
GPS	Global Positioning System
ICP	Incident Command Post
IHME	Institute for Health Metrics and Evaluation
IPAWS	Integrated Public Alerting and Warning System
JIC	Joint Information Center
JIS	Joint Information System
LNU	A Cal Fire designation for an area that Includes Sonoma, Lake and Napa Counties
LRA	Local Responsibility Area
MURS	Multi-Use Radio System
NASA	National Aeronautics and Space Administration
NAWAS	National Attack Warning Advisory System
NIMS	National Incident Management System
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCM	Natural Resources Council of Maine
PDA	Personal Digital Assistant
PEP	Primary Entry Point
PIO	Public Information Officers
RACES	Radio Amateurs in Civil Emergency Services
SCU	A Cal Fire designation for an area that includes Santa Clara, Alameda, Contra Costa, and parts of San Joaquin and Stanislaus Counties
SMC Alerts	San Mateo County alerting and warning system
SMS	Short message service

SRA	State Responsibility Area
USDA	United States Department of Agriculture
US EPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VCC	Virtual Command Center
VOST	Virtual Operations Support Teams
WEA	Wireless Emergency Alerts

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