Wildfire Readiness in the Southern California Wildland-Urban Interface

UNDERSTANDING WILDFIRE PREPAREDNESS AND EVACUATION READINESS AMONG RESIDENTS IN SOUTHERN CALIFORNIA'S WILDLAND-URBAN INTERFACE

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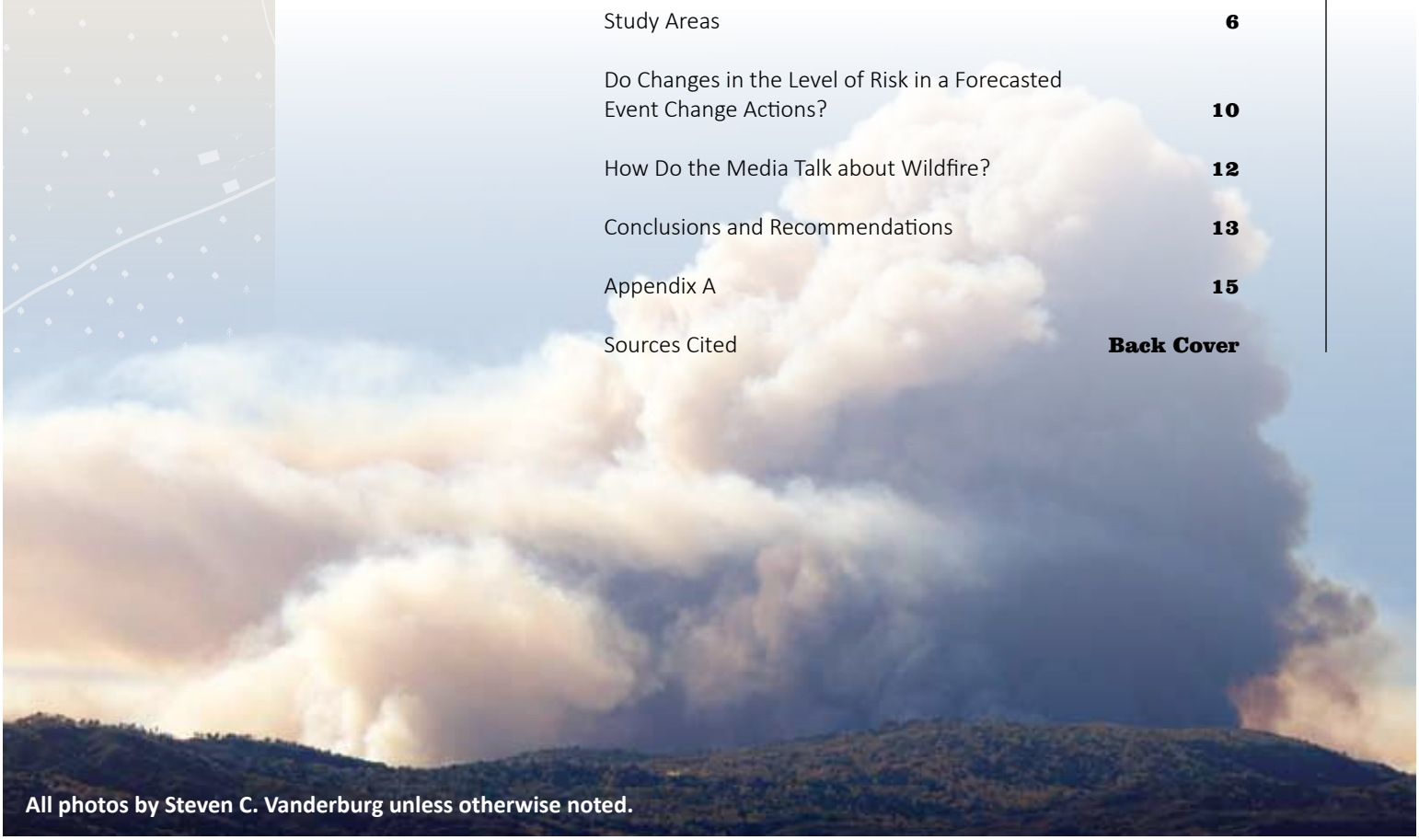


All photos by Steven C. Vanderburg unless otherwise noted.

Executive Summary

For fire and public emergency agencies, public utilities, weather forecasters, and residents, managing and adapting to wildfire in Southern California is exceptionally challenging for a number of reasons. These include weather and climate conditions that contribute to rapid fire growth and spread, population density, and restricted egress routes. In 2010, a multi-agency organizational effort began working to develop the Santa Ana Wildfire Threat Index (SAWTI) to predict large fire growth potential related to Santa Ana wind events for Southern California. The goal of SAWTI is to enable fire and emergency managers as well as the public to better prepare for extreme wildfire. This forecasting tool was released for public use in September 2014. As a part of the project, the research team initiated two surveys of English and Spanish-speaking residents living in wildfire zones in Los Angeles and San Diego Counties. This report summarizes results of this research and provides suggestions to consider for future outreach efforts. Several key themes emerged:

1. Residents use different sources of information depending on whether they are looking for daily news, daily weather forecasts, or wildfire information during a wildfire event. While many people utilize TV across all three categories, more use Web sites and smart phone apps to check the weather. During wildfire events, personal communication networks and observations (friends and family, word-of-mouth, direct interactions with fire and emergency personnel) also play significant roles in how people seek information.

2. The vast majority of survey respondents (92%) check the daily weather forecast either every day or at least some days. This provides an avenue to promote public awareness of days with high levels of large fire growth potential and encourage **specific** and **key** wildfire preparedness and evacuation readiness actions that can be implemented immediately.

3. Overall, the residents surveyed living in the less urban wildfire zones in the study area seem to understand some of the weather and climate conditions necessary for wildfires to grow and spread rapidly, suggesting that the many outreach efforts to promote wildfire knowledge may have contributed to wildfire awareness in this population. Wildfire knowledge is slightly lower in more urban areas of the study. Outreach efforts will be a continuing challenge to wildfire and emergency managers.

4. Of the many demographic variables, wildfire knowledge, wildfire experience, and wildfire risk levels examined, survey respondent location was one of the largest predictors of wildfire preparedness and evacuation readiness. This suggests that a community's development of a "culture of preparedness" may be a key factor in motivating people to take wildfire preparedness and evacuation readiness actions.

Introduction

Managing wildfire in the wildland urban interface (WUI) is exceptionally challenging in Southern California. This is due to a number of factors including weather and climate conditions that contribute to rapid fire growth and spread, the number of wildfire ignitions, population density, and restricted egress routes. Most of Southern California's extremely large and destructive wildfires occur in the autumn during Santa Ana wind events (Keeley et al. 2009) when large fire growth potential is often at its peak because fuels are dry and humidity is low. Examples include the highly destructive October 2003 fire season, where 15 fires burned 800,000 acres, including one of the largest wildfires in the state's history, the Cedar Fire. In the fall of 2007, there were more than 30 wildfire ignitions, with 17 becoming major wildfires that burned 970,977 acres, incurred 17 fatalities, and destroyed 3,069 homes and other buildings (CAL FIRE 2008).

To better forecast Santa Ana wind events, the USFS's Geographic Area Coordination Center in Riverside, California developed an Off-Shore Wind Index. Building on this effort, a multi-agency organizational effort worked to develop the Santa Ana Wildfire Threat Index (SAWTI) to predict large fire growth potential related to Santa Ana wind events for Southern California. The agencies involved included the U.S. Forest Service Geographic Area Coordination Center at Riverside, National Weather Service, CAL FIRE, San Diego Gas and Electric, University of California, Los Angeles, and the Desert Research Institute.

SAWTI was released for public use in September 2014. In support of this release, several research projects were initiated to better understand how residents living in wildfire zones in Southern California seek wildfire information; the information sources they use; their understanding of wildfire conditions; as well as preparedness and evacuation readiness actions they have taken before and during a wildfire event. This report summarizes results of this research and provides suggestions to consider for future outreach efforts to inform the public about wildfire in the WUI.

http://santaanawildfirethreat.com

Santa Ana Wildfire Threat Index (SAWTI)

SAWTI uses a comprehensive fuel model that includes dead fuel moisture, live fuel moisture, and greenness of annual grasses to create a detailed daily assessment of the fuel conditions across Southern California. This information is then coupled with calibrated weather model output (comprised of wind speed and atmospheric moisture), to generate a 6-day forecast for Large Fire Potential (LFP). LFP is compared to climatological data and historical fire occurrence to establish the index rating. SAWTI went into beta testing during the fall 2013 wildfire season. The USDA Forest Service used SAWTI to pre-position air fleet resources, fire engines, and firefighters in Ventura County immediately before the Springs Fire ignited on May 2, 2013. All pre-positioned resources were utilized in less than 24 hours. During beta testing, SAWTI successfully identified days in which large fire growth was likely, during both historic and non-historic wildfire seasons. SAWTI is now available to the public at http://santaanawildfirethreat.com.

SAWTI

Using Social Science Research to Support SAWTI

Early in SAWTI development, the project research collaborators identified a number of questions regarding SAWTI usefulness to fire and emergency managers, as well as the general public. Objectives were to encourage improved means of wildfire preparedness and evacuation readiness actions during periods with large fire growth potential during Santa Ana Wind events. To support development of SAWTI, the project collaborators identified the following key questions about residents living in wildfire zones in Southern California:

- How do residents get their wildfire information?
- What media sources do they use?
- What are the wildfire threat and preparedness messages in the media?
- Do residents understand the weather and fuel conditions necessary for large fire growth?
- What wildfire preparedness and evacuation readiness actions have residents taken in the past?
- Which wildfire preparedness and evacuation readiness actions are residents most likely to take?

To help answer these questions, several research projects (a phone survey, a Web survey, archival research addressing media reports on Santa Ana Wind events during periods with moderate to extreme large fire growth potential) were conducted. The results and implications of this research are discussed in the pages to follow, along with several recommendations for future outreach efforts to improve wildfire preparedness and evacuation readiness in Southern California.

2012 Survey of Residents Living in San Diego and Los Angeles Wildland-Urban Interface Areas

In the spring of 2012, the SAWTI development team developed a survey questionnaire to begin answering many of the questions listed above. In early October of that year, a letter describing the purpose of the study was mailed to residents living in or near the wildland-urban interface areas in San Diego and Los Angeles with the support of CAL FIRE (Figure 1). A phone survey was launched shortly afterward and completed in November 2012. The questionnaire was written in both English and Spanish, with a Spanish-speaking questionnaire administrator available if needed. In total, 1,126 people were successfully contacted; and 459 completed the questionnaire for a response rate of 41%.

FIGURE 1:

Map of the study area.

Study Areas

San Diego Area (Ramona, Alpine)

By some recent estimates, there are an estimated 2,571 properties affected by high or very high wildfire risk in the Ramona and Alpine areas, worth approximately $460M (Botts et al. 2013). In 2007, the communities of Ramona and Alpine in San Diego County were affected by the Witch Fire, in which 1,624 homes were destroyed (California Department of Forestry and Fire Protection et al. 2008). There were 213 respondents from this portion of the study area. The results of this study represent approximately 12% of the properties potentially affected by a WUI fire in the communities of Ramona and Alpine.

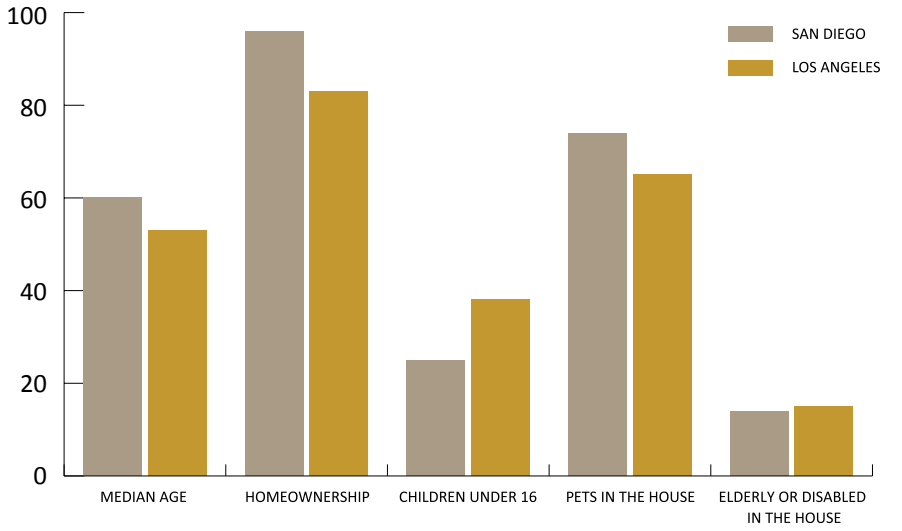
Los Angeles (Santa Clarita, Beverly Hills, Mt. Washington)

The Los Angeles region is estimated to have more than 45,000 properties in WUI areas designated as high or very high wildfire risk, collectively worth $6.5B (Botts et al. 2013). Santa Clarita was severely impacted by the Ranch, Buckweed, and Magic fires in 2007. More recently, the Powerhouse fire in 2013 burned more than 30,000 acres and destroyed 53 homes. Beverly Hills was selected as part of the study area for its vegetation level, challenging egress routes (narrow streets, limited alternative routes), and high number of residents who may need to evacuate during a wildfire event. The Mt. Washington area is similar in many ways to the Beverly Hills area but is also restricted to no on-street parking during red flag warnings for the area by the NWS during high wind events. There were 246 responses from the Los Angeles portion of the study area, meaning the study is less representative of this more high-density urban population than of the generally less urban San Diego area.

Demographics

The median age of the respondents to the phone survey was 59, making them considerably older than the median population age of 35 for both Los Angeles and San Diego Counties. There were fewer male than female respondents to the study (44%). Generally, there were more homeowners in the San Diego portion of the study area who were also slightly older and had fewer children than the Los Angeles respondents. The San Diego respondents had more pets than the Los Angeles study respondents (Figure 2).

FIGURE 2:

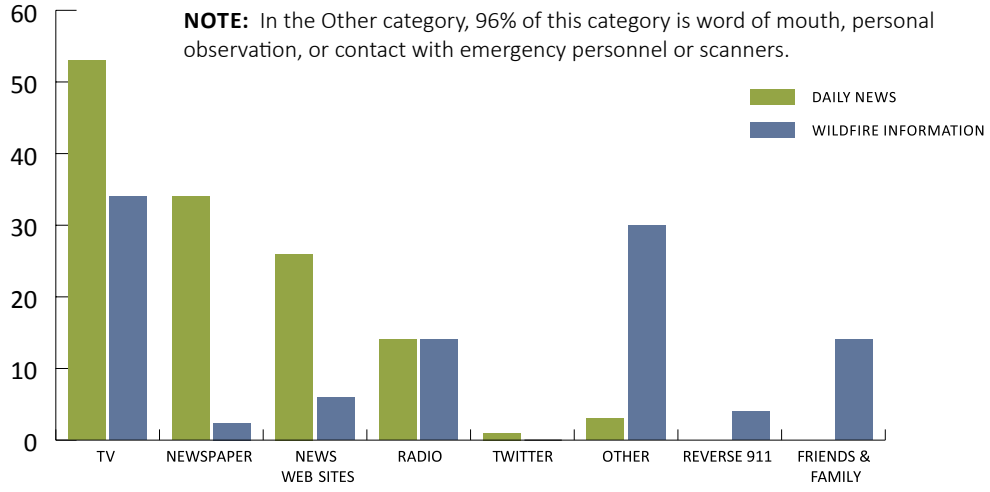


Survey respondent demographics for the San Diego and Los Angeles areas in the study area.

Information Sources for Weather and Wildfire News in the Study Area

In general, people responding to the survey tended to get their daily news from TV, newspaper, and news Web sites. During a fire, however, their sources shifted, with fewer people looking to newspapers. Instead, they relied more on sources from TV and radio. There also was a major shift toward seeking information from personal communication networks: neighbors, friends, and family members (Figure 3). Residents in these areas also began relying heavily on word-of-mouth, personal observations of smoke or ash in the air, or information from emergency personnel or scanners to keep abreast of wildfire conditions.

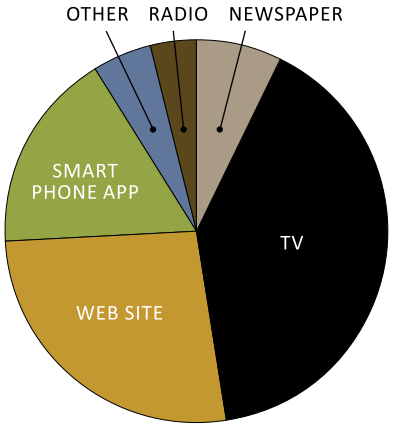
FIGURE 3:



News sources for survey respondents—daily vs. during wildfire events.

We also asked survey respondents if they had experienced a wildfire in their area, and if so, what year it occurred. Remaining questions about preparedness and evacuation readiness actions referenced this year. This may partially explain why Facebook and Twitter were not major information sources for the survey respondents in either area. For the San Diego residents, the most common date of the most remembered wildfire was 2007, which was only one year after Twitter launched in 2006. In addition, the use of social networking sites by adults (who use the Internet) was only 20% of users in 2007, compared to 72% in 2013 (Duggan and Brenner 2013). We suspect that current and future usage of social media as a wildfire information source might be higher because of these trends of increased usage of social media. However, it likely will be lower than the overall population usage given the older median age in these areas, as the use of social media is generally lower in older age cohorts.

FIGURE 4:



Daily weather information sources for survey respondents.

Almost 92% of the people surveyed replied that they always or sometimes check the weather forecast for the day. Where people in the survey look to find weather information is slightly different from where they get their daily news. Many people still get their daily weather forecast from TV, but more look on Web sites or use a smart phone app (Figure 4).

What Makes Wildfires Get Big, Fast?

To assess wildfire knowledge in the survey respondents, we combined a number of questions to create a wildfire knowledge index. This index consisted of questions about weather and vegetation conditions that cause wildfires to "get big fast," whether wildfire is worse at certain times of year, whether brown or green plants and shrubs are more susceptible to fire than green ones, and sources of wildfire ignition in the area. This index comprised a total of ten binary indicators, meaning a score of ten indicated the highest level of wildfire knowledge and a zero equaled "no knowledge." Results were then used to look at the relationship between wildfire preparedness, evacuation readiness actions, and wildfire knowledge.

Most San Diego area respondents (91%) had experienced a wildfire in their area, and 88% of San Diego respondents reported taking some kind of wildfire preparedness action. In contrast, only 62% of the Los Angeles area respondents reported having experienced a wildfire in their area, and only 46% had done something to prepare for wildfire. The average respondent score regarding wildfire knowledge (as measure by the additive wildfire knowledge index) was significantly higher statistically in San Diego (6.18) than in Los Angeles (5.52). It is important to note, however, that this result indicates those in the less urban areas are only slightly more knowledgeable about wildfire risks to their properties and themselves than are the more urban residents. Our survey results also suggest that survey respondents are aware generally of a time of year when fires are more likely; and while this awareness does make them more likely to undertake evacuation readiness actions (as does having experienced a wildfire), it doesn't seem to influence their wildfire preparedness actions. What seems to have more of a relationship to preparedness actions is overall knowledge of wildfire, experience with a wildfire, and a sense that preparedness actions will help keep them from being harmed by a wildfire.

One of the questions in the 2012 survey asked residents who reported having experienced a wildfire in their area what they had done in the past to prepare for a possible wildfire. These actions were then categorized into easy, medium, and difficult actions based on the amount of monetary, physical, and time resources invested. When the type and difficulty of pre-fire preparedness actions in each municipality were analyzed, we found that in both San Diego and LA, of those that reported doing some kind of pre-fire preparedness action, most people reported engaging in preparedness actions that required a medium amount of resources, followed by easy actions, then hard (Figure 5).

FIGURE 5:

easy

Actions classified as easy (considering resources required to perform them) include: Storing important documents and medicines in one place or a fire-safe box with copies backed up; making emergency kits with extra supplies like water, food, back-up generators, and full gas tank; making sure exit routes are planned, evacuation is planned and meeting places are planned; staying up-to-date on news of potential fires; getting CAL FIRE Inspections or general inspections.

medium

Medium effort activities include: brush clearing, clearing in general, and trimming; installing sprinkler systems, extra water pumps and hoses, and hydrants; urging others to prepare or helping friends and neighbors prepare; cleaning gutters and roof; extra watering; tagging livestock and pets, and planning for pet evacuation and care; planting fire resistant plantings; knowing how to turn off gas lines; staying home.

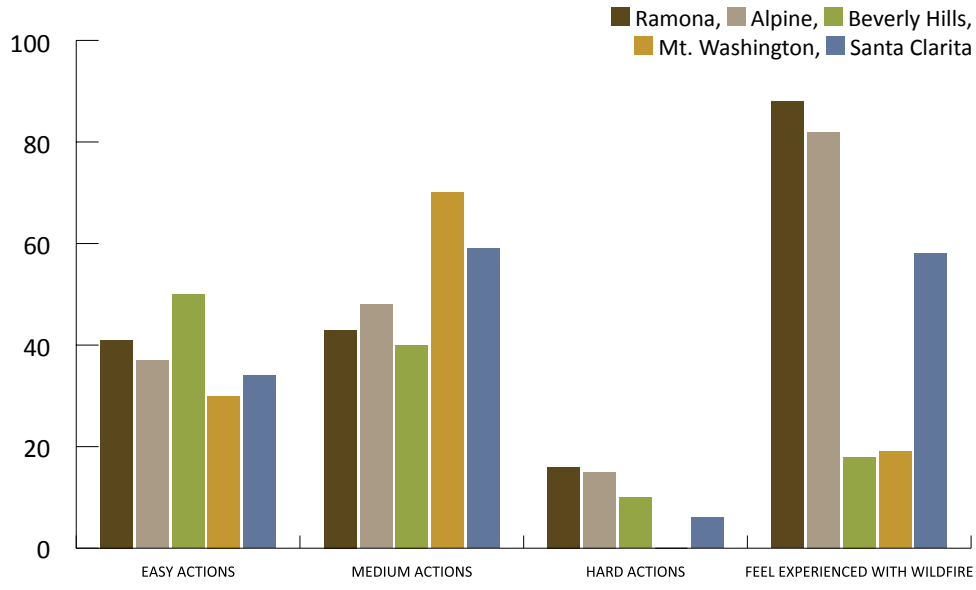
hard

Actions classified as hard include: clearing a certain distance from the house, making a fireline around the property, and creating a defensible space; installing ember suppression systems and using fireproof building materials; and having gel kits handy along with ReadyFoam and fire retardants.

Preparedness actions classified as easy, medium, and hard.

At the community level, we found that respondents in some communities in the study were more knowledgeable about wildfire than others, and people in different areas were engaging in different types of preparedness efforts (Figures 5 and 6). This confirms anecdotal evidence fire managers have observed in the field: communities tend to have different levels of wildfire knowledge and motivation to take wildfire risk mitigation actions. Despite an extensive body of wildfire research literature, understanding what drives these different levels of knowledge and actions across communities is still an open question. In an effort to understand if changes in the level of wildfire risk affected mitigation actions, we developed and conducted a follow-up survey to explore this possibility.

FIGURE 6:



Preparedness decisions by level of difficulty for each community in the study area.

Do Changes in the Level of Risk in a Forecasted Event Change Actions?

A second Internet-based Web survey in 2013 was sent to each of the original respondents of the 2012 survey to look more in depth at what types of wildfire preparedness and evacuation readiness actions were (1) most likely for participants to pursue and (2) if the actions people were most likely to pursue would change with different levels of risk in a wildfire scenario. Each individual contacted was assigned one of six different scenarios that were identical except for two key words and timing as a pre-ignition or post-ignition scenario (Figure 7). For this follow-up survey, 141 people responded, a rate of 31%. The majority of the respondents (69%) were from the San Diego area, meaning that the survey results are more representative of San Diego than Los Angeles (Figure 8). The wildfire preparedness and evacuation readiness actions used in the survey were developed from content searches on wildfire preparedness Web sites and interviews with fire and emergency managers from Los Angeles, Ventura, and San Diego counties. This sample was small and non-random. Therefore, our findings are not necessarily generalizable to all area residents. While limited conclusions can be drawn from the results, there are several themes worth noting.

FIGURE 7: Scenarios 1-6 for the follow-up preparedness actions Web-based survey.

1 It's a beautiful morning in Southern California. You hear or read that the National Weather Service is predicting Santa Ana winds tomorrow. The National Weather Service has said that this will be a **MODERATE** wind event and has issued a red flag warning for the area. Local vegetation is **DRY** from the lack of recent rain, and hot and dry weather is expected to continue through the rest of the week.

2 It's a beautiful morning in Southern California. You hear or read that the National Weather Service is predicting Santa Ana winds tomorrow. The National Weather Service has said that this will be a **HIGH** wind event and has issued a red flag warning for the area. Local vegetation is **VERY DRY** from the lack of recent rain, and hot and dry weather is expected to continue through the rest of the week.

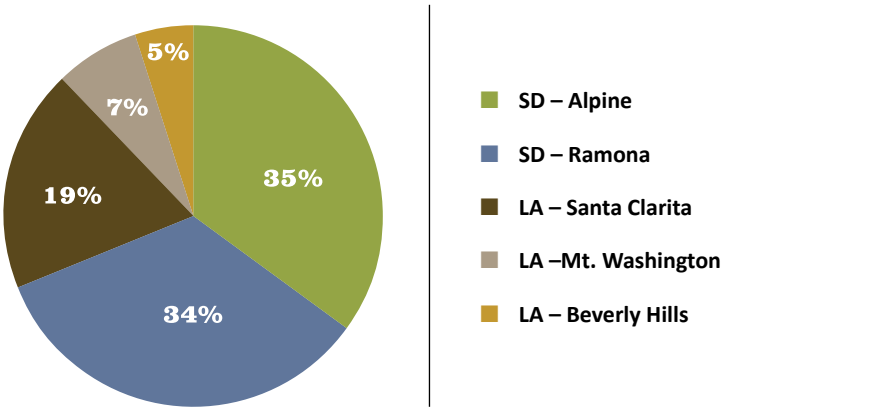
3 It's a beautiful morning in Southern California. You hear or read that the National Weather Service is predicting Santa Ana winds tomorrow. The National Weather Service has said that this will be a **ONCE-IN-A-DECADE** wind event and has issued a red flag warning for the area. Local vegetation is **EXTREMELY DRY** from the lack of recent rain, and hot and dry weather is expected to continue through the rest of the week.

4 It's a beautiful morning in Southern California. On the morning news, you hear or read that a wildfire has started approximately five miles from your home. Additionally, the National Weather Service is predicting Santa Ana winds tomorrow. The National Weather Service has said that this will be a **MODERATE** wind event and has issued a red flag warning for the area. Local vegetation is **DRY** from the lack of recent rain, and hot and dry weather is expected to continue through the rest of the week.

5 It's a beautiful morning in Southern California. On the morning news, you hear or read that a wildfire has started approximately five miles from your home. Additionally, the National Weather Service is predicting Santa Ana winds tomorrow. The National Weather Service has said that this will be a **HIGH** wind event and has issued a red flag warning for the area. Local vegetation is **VERY DRY** from the lack of recent rain, and hot and dry weather is expected to continue through the rest of the week.

6 It's a beautiful morning in Southern California. On the morning news, you hear or read that a wildfire has started approximately five miles from your home. Additionally, the National Weather Service is predicting Santa Ana winds tomorrow. The National Weather Service has said that this will be a **ONCE-IN-A-DECADE** wind event and has issued a red flag warning for the area. Local vegetation is **EXTREMELY DRY** from the lack of recent rain, and hot and dry weather is expected to continue through the rest of the week.

FIGURE 8:



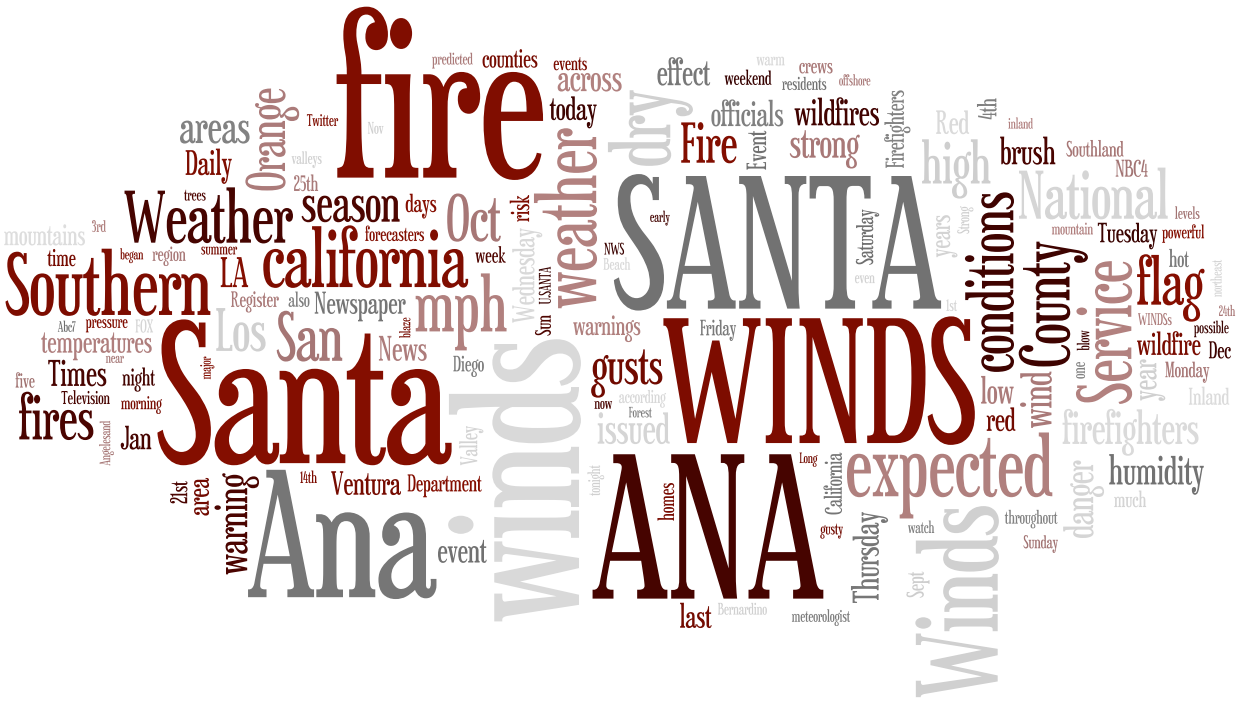
Percentage of respondents from each community for the Web-based follow-up survey.

Overall, the vast majority of wildfire preparedness and evacuation readiness actions were not influenced by the level of risk in a scenario or by pre/post wildfire ignition. The preparedness actions as rated across all of the scenarios and respondents are in Appendix A. Looking across all respondents, many of the most commonly recommended preparedness and evacuation readiness actions were rated as "maybe, somewhat, or very likely to engage in this activity" by more than 50% of the respondents. These include covering attic and other vents on the house, removing debris and other materials from decks and yards, pruning and mowing, Surprisingly, one of the most commonly recommended actions by all emergency and fire agencies, organizing a "go box" of important papers, medications etc., was rated in the likely category by slightly less than 40% of the respondents.

Generally, the results of this survey offer support to the notion that residents of WUI areas in Southern California are willing to engage in recommended wildfire preparedness actions. However, it seems that these survey respondents are more willing to engage in preparedness actions that are related to the outside of the home rather than evacuation planning and readiness actions. This suggests that even in populations motivated to mitigate their wildfire risk, there is still a need to focus on promoting evacuation readiness actions. Previous research suggests that thinking through a task—the timing, environment, and other conditions in which the task will take place—significantly improves the likelihood that it will be completed successfully (Abraham et al. 1998, Gollwitzer 1999). Continuing previous outreach efforts and developing new approaches that encourage WUI residents to think about their evacuation plans in advance, in detail, may be relevant for increasing evacuation safety during wildfire events and other natural hazards.

How Do the Media Talk about Wildfire?

To capture a sense of how the media report Santa Ana Wind events and wildfire danger, we used a database of recorded Santa Ana Wind Events in Southern California in combination with an Internet search to look at media coverage several days before and after each event. The dates covered the range from October 2003 through January 2014. Inherently, this search was limited; archived information on the Internet from newspapers, social media, and TV is often incomplete. The data set included archived portions of newspaper articles, twitter feeds, and text from TV segments archived on station Web sites. There were 17 separate incidents in the data set including events where there were no wildfire ignitions as well as ignitions (large fire sieges, such as in 2003 and 2007 were aggregated). Using text analysis, many of the expected words had a high usage frequency: fire, weather, Santa Ana winds, red flag, and warning. What was unexpected was the very limited number of prevention messages. It is possible that many prevention messages were not part of the archived records available. These results suggest that there may be an opportunity to promote short, succinct preparedness and evacuation readiness messages for dissemination through online and social media news outlets.



A wordle created using archival data of media coverage of Santa Ana wind events and high fire danger.

Conclusions and Recommendations

In summary, of the many demographic, wildfire knowledge, experience, and risk variables considered in the analysis of the 2012 and 2013 surveys, one variable stands out: the geographic location of survey participants. Geographic location was one of the most important factors in predicting the type of preparedness or readiness actions undertaken—along with understanding vegetation conditions and accidental ignition, both of which are also tied to geography. This finding suggests that the social norms and expectations of a community and development of a culture of preparedness may be key factors in engaging wildfire zone residents in behaviors that will mitigate their wildfire risk. Previous research suggests that both receiving messages about what preparedness actions to take as well as seeing neighbors complete these types of actions encourages others to do them as well (Wood et al. 2012) and also supports geographic area as a key predictor of preparedness. The results of our research also show that information sources for residents in these areas differ depending on their need—if they are looking for daily news, daily weather forecasts, or information during a wildfire event. Understanding shifts in the sources from which information is sought offers an opportunity to target preparedness and evacuation readiness messages to the most relevant media sources for each mode.

The overarching goal of the SAWTI project and this research is to give fire and emergency managers and residents of wildfire zones time to prepare when the weather and fuel conditions enable the potential for large fire growth. Our results indicate that overall, people living in wildfire zone areas have some understanding of the weather and fuel conditions necessary for large fire growth. SAWTI can help get the message out when those conditions exist. The challenge is moving people to take action.

Recommendations

1. When large fire growth conditions are present (pre-ignition), focus preparedness and evacuation readiness messages on TV, Web sites, and smart phone apps where people most often get their daily weather forecast information.

2. When large fire growth conditions are present post-ignition—in combination with TV, Web site, and smart phone apps—target personal communication networks (word-of-mouth, social media, neighborhood fire council leaders, community leaders) with **specific** and **key** preparedness and evacuation readiness actions that can be taken in the short term.

3. While the media readily discuss red flag warnings and wildfire danger from Santa Ana wind events, these messages often do not seem to contain preparedness or evacuation readiness messages. Providing short, succinct, **specific** and **key** preparedness and evacuation readiness actions to media outlets would help reinforce preparedness and readiness messages from other sources.

4. Much work has been done in Los Angeles, Ventura, and San Diego Counties by local fire agencies, CAL FIRE, and the U.S. Forest Service to promote community wildfire preparedness. Given the importance of geographic area in this research as a predictor of preparedness and readiness actions, continuing to develop a culture of preparedness at the community and neighborhood levels is likely an essential step to increasing the number of people taking action. This is especially important in more transient urban areas, where there is a higher percentage of renters and migration in and out of neighborhoods. One way to reach this population may be through encouraging or incentivizing landlords and building owners to undertake preparedness actions, and to promote basic evacuation readiness actions with their tenants. Seeing others take action is a crucial motivator for individuals to take action.

5. Findings from this research suggest an opportunity for using SAWTI to reach residents during periods with large fire growth potential and forecasted Santa Ana Wind events. Since many people already use the Internet (via Web sites or smart phone apps) to get their daily weather information, linking the SAWTI Web site to commonly used weather information Web sites may help raise wildfire risk awareness several days before a forecasted event. These information sources also offer an opportunity to remind residents living in wildfire zones of the preparedness and evacuation readiness actions they should take. Creating links to SAWTI and other preparedness and evacuation readiness actions on the Facebook pages of those in influential positions (e.g., wildfire council leaders, municipal government representatives, and other community leaders) in wildfire-urban zone neighborhoods also may be a viable way to tap into the word-of-mouth and friend and family networks that gain relevance during a wildfire event.

6. Wildfire preparedness and evacuation readiness messages from multiple sources that are consistent with each other likely will have the most impact in galvanizing people to take action. The National Weather Service, fire agencies, and emergency services should consider coordinating the **specific** and **key** preparedness and evacuation readiness actions they want to promote during the period before a moderate to extreme SAWTI forecast. These actions should be small in number, easily doable, reflect the short time period, and be formatted for Web sites and smart phone apps. To minimize language and literacy barriers, clear graphics of each action should accompany written descriptions or labels.

Appendix: A

FIGURE 9:

	SAN DIEGO Percent Expressing they would "Maybe" or are "Somewhat" or "Very" Likely to Engage in this Activity	LOS ANGELES Percent Expressing they would "Maybe" or are "Somewhat" or "Very" Likely to Engage in this Activity
Seal garage door openings with duct tape	95	92
Remove lightweight curtains	90	83
Install mesh screens over chimney outlets and other vents	86	72
Clean debris from under decks	83	75
Clear flammables from around propane tank	77	89
Seal attic and ground vents with nonflammable covers	80	69
Move woodpiles away from home	77	81
Move flammable items inside	77	69
Review how to turn off propane tank	63	83
Register mobile phones with county alert service	68	72
Clean gutters	70	64
Move flammable items away from windows and doors	68	61
Clean roof	65	64
Clean debris from planters and flowerpots	69	56
Trim shrubs and landscaping	65	61
Mow lawn and weeds around home	68	56
Remove lawn chair cushions or move chairs inside	62	50
Store or move flammable liquids	17	22
Check with homeowner's insurance	61	47
Pre-emptively move livestock and pets	53	64
Remove cuttings and flammables from property	57	44
Rake debris	54	50
Establish household evacuation plan	51	47
Establish phone tree	38	56
Sweep decks	38	42
Discuss household schedules, pickup plans, meeting places	40	39
Organize to-go box (documents, medication, phone charger)	22	39
Roll up vehicle windows	35	14
Keep gas tank half full	11	22
Close all windows, doors, vents etc. when gone from home	10	17
Keep cell phone charged	9	17
Monitor weather reports and media	5	14
Pay attention to wind patterns	3	14

Percent of all respondents expressing they would be "maybe" or are "somewhat" or "very" likely to engage in a wildfire preparedness or evacuation readiness action after reading one of six possible scenarios from a web-based survey.

Sources Cited

Abraham C., P. Sheeran, M. Johnston. 1998. From Health Beliefs to Self-Regulation: Theoretical advances in the psychology of action control. ***Psychology and Health***, 13, 569-591.

Botts, H., T. Jeffery, S. McCabe, B. Stueck & L. Suhr. 2013. CoreLogic Wildfire Risk Report: Residential Wildfire Exposure Estimates for the Western United States.

California Department of Forestry and Fire Protection, United States Forest Service, California Office of Emergency Services. 2008. California Fire Seige 2007: An Overview.

Duggan, M. & J. Brenner. 2013. ***The Demographics of Social Media Users***, 2012. Pew Research Center's Internet & American Life Project Washington, DC.

Gollwitzer, P.M. 1999. Implementation Intentions: Strong effects of simple plans. ***American Psychologist***, 54, 493-503.

Keeley, J. E., H. Safford, C. J. Fotheringham, J. Franklin & M. Moritz (2009) The 2007 Southern California Wildfires: Lessons in Complexity. ***Journal of Forestry***, 107, 287-296.

Wood, M. M., D. S. Mileti, M. Kano, M. M. Kelley, R. Regan & L. B. Bourque (2012) Communicating Actionable Risk for Terrorism and Other Hazards. ***Risk Analysis***, 32, 601-615.

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