

JUNE 2019

# WILDFIRE: AN ISSUE PAPER

Lessons Learned from the 2017–2018 California Events

American Academy of Actuaries  
Extreme Events and Property Lines Committee



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# Wildfire: An Issue Paper

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JUNE 2019

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# Executive Summary

In recent years, California has experienced repeated cycles of rain, drought, and wildfire, causing unexpectedly high levels of insured losses due to fire and related mudslides.

Wildfires in California in 2017 and 2018 were among the largest and most costly on record.

Homeowner and commercial insurance policies have been interpreted broadly to cover more losses than insurers anticipated. Projections of future insured losses will have to include these broader definitions of what is covered.

Changes in the wildland-urban interface (WUI) have had a significant impact on insured losses. Development in what was previously undeveloped wildland has resulted in increased exposure to potential loss.

About one-third of houses and people in the U.S. are now within the WUI. Approximately 43% of all new homes built between 1990 and 2010 were built in the WUI.

Modeling of wildfire risk is very complex. Compared to hurricane and earthquake simulations, acceptance and use of wildfire models is still in an early stage.

Limited use of wildfire models is due in part to the absence of generally accepted modeling standards for wildfire. In contrast, hurricane modeling developed rapidly after regulators in Florida set consistent and understandable standards for hurricane model review.

The Florida Commission on Hurricane Loss Projection Methodology provides a case study in how regulators can help speed the development and acceptance of catastrophe modeling that is helpful to insurers and the public.

Without regulatory standards for wildfire models, insurers use a multiyear long-term average of historical events to estimate future losses. This may not be as useful as modeling when it comes to understanding an evolving risk.

# An Overview of Wildfire Risk

In the past few decades, there have been many large catastrophes that triggered major disruptions in the insurance industry—for example, Hurricane Andrew in 1992, the Northridge earthquake in 1994, the 9/11 terrorist attacks in 2001, and the Thailand floods in 2011.

Each of these extreme events caused losses outside the expected range and brought about solvency issues for several insurers. In the aftermaths, there were regulatory reactions that limited insurer actions, and in many instances, created “coverage creep,” where insurers were surprised to find their policies were being interpreted to cover losses they did not anticipate. These events ultimately led to a better understanding of risk and compelled the advancement of catastrophe modeling. We find that many of the factors that characterized these major industry disruptions are also present in the California wildfires of 2017 and 2018. As a result, there is a need for insurers to rethink how they should provide coverage, how to better assess the risk through catastrophe modeling, and how they can work with regulators in order to enable them to offer needed coverage to consumers.

The wildfires that struck California in late 2017 and throughout 2018 may well be viewed as a “perfect storm.” After being plagued with several consecutive years of drought, in the fall of 2016 and early winter of 2017 California received much-needed relief in the form of rain and snowfall. In what was one of the wettest winters in over 20 years,<sup>1</sup> the state quickly went from dealing with droughts to having to deal with flooding. Northern California was most heavily impacted by the flooding, which caused dams to overflow and spillways to fail and which resulted in substantial property damage and numerous evacuations. Most notably, in February 2017 over 188,000 people were evacuated due to the concern that the Oroville Dam emergency spillway might collapse.<sup>2</sup>

The spell of rainfall was relatively short-lived, however, and immediately on its heels was yet another period of drought. The precipitation that came in early 2017 had spurred new growth of vegetation and ground cover, and the ensuing drought quickly dried out that vegetation, making conditions prime for potential wildfires. In October 2017, Northern California experienced an outbreak of large wildfires, most notably the Atlas, Nuns, Tubbs and Redwood Valley fires. According to the Cal Fire website,<sup>3</sup> Atlas, Nuns, and Tubbs

<sup>1</sup> “Northern California gets its wettest winter in nearly a century”; *Los Angeles Times*; April 13, 2017

<sup>2</sup> “188,000 evacuated as California’s massive Oroville Dam threatens catastrophic floods”; *Washington Post*; February 13, 2017.

<sup>3</sup> “Archived Incident Information”; CA.gov.

burned nearly 145,000 acres of land in Napa, Sonoma and surrounding counties. The Redwood Valley fire burned over 35,000 acres in Mendocino County. All four of these October fires made the list of the 20 most destructive California wildfires in history.<sup>4</sup> These fires resulted in over 24,000 residential insurance claims of which nearly 6,000 were total losses, and sadly 40 lives were lost.<sup>4,5</sup>

In December 2017, Southern California experienced its own devastating wildfires. That part of the state was hit with the largest wildfire recorded at that time in modern history, in what was referred to as the Thomas fire. This wildfire impacted the Ventura and Santa Barbara County areas, totaling over 280,000 acres of burn area.<sup>6</sup> Also in December, although not necessarily the largest in terms of acres burned, the Creek (Los Angeles County) and Lilac (San Diego County) wildfires caused many structures to be destroyed. The Skirball fire, in a densely urban area of Los Angeles County, caused freeway and school closures and threatened the famous Getty Center Museum.<sup>7</sup> Between the Thomas and the other December 2017 wildfires, just shy of 16,000 residential insurance claims were reported, with almost 900 of those being total losses.<sup>8</sup> Thomas also at that point became one of the 20 most destructive California wildfires in recorded history, resulting in the 2017 fires comprising 25% of the events on that list.<sup>9</sup>

Insured losses from the October and December 2017 wildfire events totaled nearly \$12 billion, with over 80% from residential policies.<sup>8</sup> Adding to the woes of the residents of those areas, several weeks later, torrential rains in January 2018 caused significant flooding and massive numbers of mudslides in the wildfire-ravaged areas, which resulted in additional mandatory evacuations for thousands of people and hundreds of millions of dollars in property losses.

Subsequent months of 2018 showed no reprieve. In July, the Carr wildfire in Northern California burned nearly 230,000 acres, and the Mendocino Complex fire, also in Northern California, burned approximately 460,000 acres making it the new record holder for largest wildfire in the state.<sup>10</sup> In contrasting the two events, despite the Mendocino Complex fire being twice the size of the Carr fire in terms of burn area, the number of insurance claims reported from the Mendocino Complex fire was less than half those resulting from the Carr fire. An even greater contrast exists when examining the number of residential total loss claims, where the Mendocino Complex fire had roughly 60 compared to the Carr fire which produced approximately 850.<sup>8</sup> These latter points highlight the impact that the wildland-

4 ["Top 20 Most Destructive California Wildfires"](#); CA.gov; March 14, 2019.

5 ["Insured Losses from the 2018 Mudslide and the 2017 & 2018 Wildfires"](#); California Department of Insurance; September 6, 2018.

6 ["Top 20 Largest California Wildfires"](#); CA.gov; March 14, 2019.

7 ["Fire threaten LA mansions, Getty museum"](#); *Boston Globe*; December 6, 2017.

8 ["Insured Losses from the 2018 Mudslide and the 2017 & 2018 Wildfires"](#); California Department of Insurance; September 6, 2018.

9 ["Top 20 Most Destructive California Wildfires"](#); CA.gov; March 14, 2019.

10 ["Top 20 Largest California Wildfires"](#); CA.gov; March 14, 2019.

urban interface, described later in this paper, can have on the number of insurance claims, the number of total burns, and ultimately the magnitude of the overall insured loss.

In November 2018, wildfires struck California yet again. In Butte County in Northern California, the Camp wildfire wreaked havoc and essentially destroyed the entire town of Paradise. This fire ultimately burned over 150,000 acres, claimed 86 lives and nearly 19,000 structures in its wake, and quickly jumped to the top of the list of most destructive wildfires in California.<sup>9</sup> At around the same time, in Southern California in Los Angeles and Ventura counties, the Woolsey wildfire burned approximately 100,000 acres, took three lives, and destroyed over 1,600 structures.<sup>9</sup> In less than a year's time, from December 2017 to November 2018, California had seen the two largest wildfires ever recorded (in data that goes back to 1932), and three of the top seven.<sup>10</sup>

In September 2018, the California Department of Insurance (DOI) produced a report highlighting the insurance impact from the fires to date.<sup>8</sup> Between the October 2017 wildfires, the December 2017 fires and the rain-induced ensuing mudslides, and the wildfire events through July 2018, nearly 68,000 claims were submitted, amounting to just shy of \$14 billion of insured loss. Over 50,000 of those claims came from homeowners' policies, with an average claim amount of \$230,000. It is worth noting that approximately 16% of submitted claims from these events were associated with a total loss. In January 2019, the California DOI reported that the November 2018 wildfire losses from Camp and Woolsey amounted to approximately \$11.5 billion insured loss, with 28% of claims from total burns. This put the combined insured losses from the 2017 and 2018 wildfires at approximately \$26 billion, and illustrated just how financially devastating this catastrophic peril can be. And, unfortunately, they also illustrate how personally devastating these events can be, as these fires caused numerous severe injuries and claimed the lives of a number of civilians as well as firefighters who worked hard to stop the destruction.

The purpose of this paper is to examine a few key areas that warrant discussion after these recent events placed a spotlight on how devastating wildfires can be to the general population, as well as the impact to the insurers and reinsurers. The paper is laid out in three sections:

- Section I looks at the significance of the wildland-urban interface and the importance of establishing fire zones and mitigation methods.
- In Section II, the paper explores the current state of modeling and pricing for the wildfire peril, and potential areas for improvement.
- Finally, in Section III, there is an examination of legislative and regulatory outcomes which came about as a result of the record-breaking California wildfire events.

# Section I—

## Wildland-urban interface, fire zones, prevention, and mitigation

**Wildfires are uncontrolled fires burning in natural areas such as forests, grasslands, or prairies that can be caused by lightning or by people, either accidentally or intentionally.**<sup>11</sup> In the United States, approximately 90 percent of wildfires are caused by people: the result of leaving campfires unattended, negligently discarding cigarettes, burning debris, or intentional arson.<sup>12</sup> The ignition of wildfires can also be caused by man-made infrastructure, such as power lines that come into contact with trees under windy conditions.<sup>13</sup> Furthermore, suppression of naturally occurring fires, another human activity, allows vegetation to grow and provides more fuel for eventual uncontrolled fires. The consequences of wildfires are wide-ranging, from personal injuries and death, economic loss, and changing the local ecosystem and biodiversity to forest degradation and air pollution.<sup>14</sup>

Lightning strikes randomly, so when it does start a wildfire, more often than not the fire would burn in the middle of a forest or grassland away from populated areas. When a wildfire does not pose a threat to humans, firefighters will occasionally let the area burn, as it will often benefit the ecosystem.<sup>15</sup> On the other hand, when a wildfire originates or moves close to a populated area, it can cause massive destruction to human life and property as the fire spreads from the natural areas to developed lands.

A wildland-urban interface (WUI) refers to an area where human development is adjacent to or mixed in with undeveloped wildland. A WUI is not a static or fixed area, but can change over time such as when urban development expands or when wildland vegetation spreads. WUI may refer to two different concepts: interface and intermix. The former refers to a zone where continuous wildland is adjacent to a developed area, while the latter refers to an area where residential and commercial structures are intermixed with the wildland. However, wildland-urban interface is often used to refer to both types, and unless otherwise specified, it is this general interpretation that will be used in this paper.<sup>16</sup>

<sup>11</sup> “Wildfires”; Ready.gov.

<sup>12</sup> “Wildfire Causes and Evaluations”; National Park Service website; November 27, 2018.

<sup>13</sup> “The Link Between Power Lines and Wildfires”; *Electrical Contractor*; November 2018.

<sup>14</sup> “Causes and Effects of Wildfires”; *Earth Eclipse*.

<sup>15</sup> “Human-started wildfires expand the fire niche across the United States”; *Proceedings of the National Academy of Sciences of the United States of America*; February 27, 2017.

<sup>16</sup> “Wildland-Urban Interface (WUI) Change 1990-2010”; University of Wisconsin-Madison Silvics Lab Spatial Analysis For Conservation and Sustainability.



People will seek out the beauty and solitude of living in and around these areas.

In the context of insurance, wildland-urban interfaces and how they have changed over the years is significant. The WUI is directly related to the exposure of property to wildfires and the resulting insurance loss. As mentioned above, the majority of wildfires are caused by people, and furthermore, most wildfire ignitions occur in the WUI.<sup>17</sup> As WUI areas expand, the number of ignitions caused by humans will increase, and the number of wildfires that occur will rise as well.

In some respect, the simplest solution to the problem of wildfires threatening life and property in WUIs would be the prohibition of development in WUIs. However, that might not be likely to happen, as people will seek out the beauty and solitude of living in and around these areas. And despite the risk of wildfires that is associated with WUIs, all aspects of them have grown over the years: the amount of land area, population, and number of homes. Based on a 2018 study using Census data,<sup>17</sup> the geographical area of WUIs has grown from 7.2% of the contiguous United States in 1990 to 8.5% in 2000 and 9.5% in 2010. Over those two decades WUI land area grew approximately 32%. In absolute terms, new WUI area in 2010 was about 189,000 square kilometers, or about the size of Washington state. While less than a tenth of the contiguous U.S. is WUI in terms of land area, about a

<sup>17</sup> [“Rapid growth of the US wildland-urban interface raises wildfire risk”](#); *Proceedings of the National Academy of Sciences of the United States of America*; February 6, 2018.

third of houses and people in the United States reside in the WUI. Over those two decades, the number of houses within a WUI area increased by 12.7 million (from 30.3% to 33.2%), and the number of people living in WUIs increased by 25 million (from 29.4% to 31.9%). It is important that approximately 43% of all new houses were built in WUIs during the period 1990 to 2010, so the density of houses in WUIs has increased as well.

When considering wildfire risk exposure, many other factors besides WUI come into play. Environmental conditions such as low humidity, high temperatures, and strong winds can increase the probability of ignition, exacerbate, and spread the wildfire. Most properties are not destroyed by the actual fire front, but rather by embers carried by the wind, starting new fires.<sup>18</sup> There is also evidence that urban development increases air temperatures, as the natural environment is replaced with impervious surfaces, such as roads, sidewalks, and parking lots.<sup>19</sup> While California is not one of the leading states in terms of actual WUI growth, its dry weather combined with the opportunity for high winds and high temperatures create an environment for wildfires to ignite and persist. In addition, there has been a massive tree mortality occurring in the forests of the Sierra Nevada. In California the scale of this mortality is so large that there is a greater potential for “mass fire” in the coming decades due to the amount of dry, combustible, woody material that can produce large, severe fires.<sup>20</sup>

Because wildfire is a recurring threat, the California state government has dedicated agencies such as Cal Fire to educate people, help to protect their property, and develop strategic plans to fight fires across the state. The 2018 Cal Fire Strategic Fire Plan includes goals such as identifying wildfire hazards, supporting local plans that address fire protection, increasing fire prevention awareness, and determining resources necessary for fire prevention and suppression. Among the resources offered are Fire Hazard Severity Zone Maps for each county, in which districts are colored by different shades to indicate the degree of risk as indicated by the state agency. The development of these different zones is based on a fire hazard model that takes into account the wildland fuels, topography, and weather of an area. Many cities have their own local agencies that may have more detailed maps and indications for Fire Hazard Severity Zones. In these cities, before a new building can be built within a Severity Zone, an application for a building permit in compliance with building codes needs to be submitted. Generally, these building codes call for removing flammable materials from around the building (creating a defensible space),

<sup>18</sup> “[What is the Wildland-Urban Interface?](#)”; Ready, Set, Go! Program.

<sup>19</sup> “[California’s Forests and Rangelands 2017 Assessment](#)”; California Department of Forestry and Fire Protection Fire and Resource Assessment Program.

<sup>20</sup> “[Drought, Tree Mortality, and Wildfire in Forests Adapted to Frequent Fire](#)”; American Institute of Biological Sciences; January 17, 2018.

and using fire-resistant material in the construction of the building.<sup>21</sup> Besides building construction standards, other applications of these maps include city and county land use plans, property development standards, and natural hazard disclosure at the time of sale. The state maps were developed in 2007, while local maps were developed

## New maps would provide a revised understanding of wildfire risk in California.

between 2008 and 2011. As of the date of this publication, Cal Fire has plans to update these maps by the end of 2019. Given the changing WUI, new maps would provide a revised understanding of wildfire risk in California. Other states, where WUIs are large or growing, should be encouraged to consider adopting such procedures and practices that have been implemented in California.

From a federal government perspective, the Federal Emergency Management Agency (FEMA) recognizes the expansion of the wildland-urban interface and the increased exposure of buildings to wildfire risk. FEMA provides a guide to building homes in a WUI, in which it offers detailed recommendations for building design and construction methods to improve the chances of a building's survival in the event of a wildfire. The agency also emphasizes community infrastructure, such as local water resources and emergency vehicle access.<sup>22</sup> Town planning and building departments should be encouraged to review the latest FEMA WUI building recommendations.

As wildfire risk exposure continues to grow through increased WUI area and changing climate, there is an increasing importance placed on recognizing and implementing ways to prevent and mitigate the risk. Individuals can be encouraged to remove flammable materials and clear vegetation on their properties, and make their homes more fire-resistant by replacing building materials. At the same time, insurers can perform regular inspections of homes in wildfire-prone areas and offer mitigation credit if appropriate. Towns and cities can take steps to educate homeowners, train firefighters, implement stricter building codes, and establish strategic fire plans. Builders of new developments could be required to supply town planning departments with a hazard assessment that reports the history of wildfires, subsequent flooding and debris flows, and what is in the WUI now and what will be in the WUI after development. States could allocate additional resources for combating fires, supporting local fire plans, and fostering research on how to establish fire-resistant communities. All of these types of measures would help build safer and more resistant communities across the nation.

<sup>21</sup> "Fire Hazard Severity Zone Re-Mapping Project"; Cal Fire website; accessed June 20, 2019.

<sup>22</sup> "Home Builder's Guide to Construction in Wildfire Zones"; Federal Emergency Management Agency (FEMA) U.S. Department of Homeland Security; September 2008.

# Section II—

## Exploring the current state of wildfire modeling, pricing for the wildfire peril, and potential areas for improvement

### Current state of wildfire modeling and pricing

Similar to hurricane and earthquake simulation models used by insurers for over two decades, wildfire models are complex. In some ways, wildfire modeling is more difficult due to the localized nature of wildfire exposure and losses. Identifying broad areas that could be exposed to wildfire potential can be done, but understanding why specific exposed properties burn while others avoid damage has challenged modelers. Human contribution to the ignition trigger further complicates the ability to model the hazard. Many factors and conditions impact the magnitude of insured losses caused by a wildfire. Typically a wildfire model will consider factors such as ignition, fuel source, temperature, humidity, seasonal wind, land use and land cover, wildland-urban interface, impact of embers and smoke, fire detection and suppression capabilities, building construction and materials, and insurance policy terms and conditions.

Compared to hurricane and earthquake simulation models, acceptance and widespread usage of wildfire models are in an early stage. The 2017 and 2018 wildfire seasons in California may have been a wake-up call for insurers, reinsurers, regulators, and property owners. The 2017–2018 events heightened the awareness of wildfire risk and raised strong interest from stakeholders to understand and assess wildfire risks holistically using all available tools, including stochastic models.

Without any recommendation, various commercial wildfire stochastic models have been available in the marketplace for several years, including AIR Worldwide, a subsidiary of Verisk; Impact Forecasting (IF), a subsidiary of Aon; and CoreLogic. Risk Management Solutions (RMS) released its first wildfire model in the summer of 2018. These wildfire modelers attempt to assess wildfire risk in multiple U.S. states in which significant loss-causing wildfires have historically occurred, enabling contiguous modeling of wildfire



activity across state boundaries. Recently released updates build on research showing that climate and weather are some of the major influences affecting annual area burned in the U.S.—particularly relationships between temperature, precipitation, and drought. The most recent updates of the wildfire models also have improved resolutions, providing a more realistic representation of fire behavior and variations across different regions, and enabling model users to develop loss metrics from the portfolio level down to individual locations.

The use of wildfire models by insurers for pricing wildfire risk has been somewhat limited. Insurance companies are still relying largely on historical loss experience by region to provide for wildfire factors in ratings. Part of the reason for the limited use is that no regulatory body has thoroughly reviewed any of the wildfire models and no generally accepted modeling standards have been established for wildfire models. The Florida Commission on Hurricane Loss Projection Methodology (FCHLPM) set consistent and understandable standards for hurricane model review. That process promoted the transparency and rigor of modeling development, and increased users' confidence in hurricane model results. Stakeholders of catastrophe models—including modeling vendors, consumers, regulators, and insurance and reinsurance companies—would benefit from a rigorous and standardized review process.

## Major barriers for accurately projecting wildfire losses

Similar to other modeled catastrophic perils, there are significant uncertainties around model estimates and large ranges of output values among different wildfire models. Many assumptions are involved in creating catastrophe models. Below is a list of some barriers that create challenges in accurately pricing for this peril, some of which are recent factors:

- Compounding high winds with other fuel factors
- Effectiveness of early detection and fire suppression efforts
- Determining the return period or likelihood of the 2017 and 2018 events and weather conditions
- Uncertainty around human-related ignition
- Lack of comprehensive exposure data such as appurtenant structures
- Incorporating the impacts of risk-mitigation efforts
- Post-event factors such as additional living expenses, demand surge, building code changes, potential for subrogation, and rulings made such as mudslides being deemed covered
- Potential impacts of climate risk (see an in-depth report from the California Department of Insurance that focuses on related impacts)<sup>23</sup>

A large range of output does not mean that any model is inaccurate or unreliable, but these wide ranges of model outputs can cause concerns with consumers, regulators, and executives. However, continued and regular use could help to allay concerns.

## Potential actions

The devastating impact of Hurricane Andrew on Florida and the Gulf Coast in 1992 served as a catalyst for the insurance industry to look for new ways to assess hurricane risk, ultimately resulting in widespread adoption of hurricane models. There are those who hope that the 2017 and 2018 wildfire seasons in California could similarly serve as a catalyst for the insurance industry to take a different approach toward wildfire risk and develop a better understanding and appreciation for wildfire modeling. Vendors are critical partners in educating the insurance industry and regulators on wildfire models, similar to their roles in advancing the acceptance and reliance on hurricane modeling.

<sup>23</sup> [“Trial By Fire: Managing Climate Risks Facing Insurers in the Golden State”](#); California Department of Insurance; September 2018.

One challenge that has slowed the evolution of wildfire models has been the lack of detailed claims data to help modelers better understand the propensity for loss in a wildfire event. The 2017 and 2018 wildfire seasons generated a large number of claims, however. It also provided valuable insight into ancillary loss coverage, such as temporary housing, business interruption, and subsequent mudslides. Modeling vendors could use detailed claims data from these recent seasons to refine their assumptions and improve their models.

**An impartial national-level review of models may be the most efficient way to increase confidence in wildfire models.**

Rigorous modeling review similar to that done by FCHLPM not only promoted better modeling techniques and greater transparency to modeling assumptions and processes, but it also brought the insurance industry, regulators, vendors, and consumers together. However, FCHLPM review is at the state level, with a focus on how well the individual models assess Florida's hurricane exposure specifically. It is an expensive process, both to the state government and to the vendors. Individual states should exercise caution if establishing a wildfire modeling review process. An impartial national-level review of models may be the most efficient way to increase confidence in wildfire models.

With California as a major focus of wildfire activity, the development of wildfire models that are acceptable to California regulators will be critical. California regulations currently only allow for the use of complex catastrophe models for the perils of earthquake and fire following earthquake. For other perils including wildfire, insurers are expected to use a multiyear, long-term average of historical events to develop a catastrophe provision. It is likely that a long-term average of past losses might not accurately reflect the current wildfire risk, and can promote rate instability when significant events occur, such as in 2017 and 2018. Regulators should be encouraged to become more familiar with and consider the benefits of wildfire models.

# Section III—

## Regulatory and legislative actions as a result of the 2017 and 2018 wildfires

Many regulatory and legislative actions have been taken in the state of California as a result of the wildfires in 2017 and 2018. Three important goals of any state insurance regulatory department are to ensure availability and appropriate rates of insurance to consumers, to make sure insurance companies treat their insureds fairly in their time of need, and to promote the solvency of insurance carriers.

One of the more prominent bills enacted in California was in relation to mudslides being considered a covered peril on a standard homeowners policy. In response to mudslides in the Montecito area, the California insurance commissioner issued a formal notice to insurers that mudslide, landslide, and debris flow in areas that were recently impacted by wildfires would be covered if “it is determined that the ravaging of hillsides and vegetation by the Thomas and other fires was the efficient proximate cause of the mudslides.”<sup>24</sup> It was further noted “both the Insurance Code and case law have established the legal doctrine of ‘efficient proximate cause’ which means if the facts show the Thomas Fire, a covered peril, was the efficient proximate cause of the subsequent mudflow, mudslides, debris flow, landslide, or other similar event, then damage caused by those events should be covered under the property owner’s insurance policy.”<sup>24</sup> Mudslide is a peril normally covered under a flood policy and is typically excluded from a standard homeowners policy. The sentiment of the bill was that the mudflow would not have occurred if not for the preceding wildfire.

Another bill of note, *Senate Bill 901*, aimed at wildfire mitigation and prevention efforts, with funding provided and managed by the California Department of Forestry and Fire Protection.<sup>25</sup> In response to several of the 2017 wildfires’ ignition being attributed to Pacific Gas and Electric Company (PG&E), the bill provided PG&E with the ability to borrow funds in order to pay off its liabilities.<sup>26</sup> The bill also provided utility companies the ability to pass some costs down to their customers if they are found to be at fault, but not negligent, for the cause of the wildfire. This applies only to wildfires in 2019 and beyond. In January 2019, PG&E announced its intent to file for bankruptcy amid the anticipation of the 2018

<sup>24</sup> [“Jones issues formal notice to insurers regarding mudslide coverage for homeowners”](#); California Department of Insurance; January 29, 2018.

<sup>25</sup> [Senate Bill No. 901](#); California Legislative Information; September 21, 2018.

<sup>26</sup> [“CAL FIRE Investigators Determine Causes of 12 Wildfires in Mendocino, Humboldt, Butte, Sonoma, Lake, and Napa Counties”](#); California Department of Forestry and Fire Protection; June 8, 2018.

Camp wildfire resulting in several billions of dollars in claims against it, on top of the 2017 claims.<sup>27</sup> Time will tell how the litigation will play out, and who will ultimately bear the costs.

Below are various other bills and requests that were proposed following the 2017 wildfire catastrophes.

- The California Department of Insurance (CDI) issued a formal notice to insurers directing them to cease any and all moratoriums on issuing auto insurance in wildfire areas and reminding them that California law prohibits this practice.<sup>28</sup>
- The CDI also issued a cease-and-desist order requiring the California FAIR Plan to terminate immediately the moratorium it initiated on writing new fire insurance coverage in wildfire-impacted areas and ordered the FAIR Plan to make its fire insurance products available to all eligible Californians in keeping with its statutorily mandated purpose.<sup>29</sup>
- SB 824—Approved by Governor September 21, 2018. Filed with Secretary of State September 21, 2018.<sup>30</sup>
  - The bill prohibits, with certain exceptions, an insurer from canceling or non-renewing a residential property policy for one full year based solely on the fact that the insured structure is located in an area in which a wildfire has occurred and a state of emergency was declared.
  - The bill also requires an admitted insurer with written premiums in California above a specified threshold to submit a report with specified fire risk information on its residential property policies to the commissioner every two years. It also requires the commissioner to post a report on wildfire risk compiled from the submitted data to the department’s website every two years.
- SB 894—Approved by Governor September 21, 2018. Filed with Secretary of State September 21, 2018.<sup>31</sup>
  - Under specified circumstances, the insurer is required to offer to renew the policy for at least the next two annual renewal periods or 24 months, whichever is greater.
  - For policies with dollar limits on the coverage of additional living expenses, the bill grants an extension of that coverage for up to 12 additional months, for a total of 36 months, if the insured, in good faith, encounters delays in the reconstruction process that are a result of circumstances beyond their control.

<sup>27</sup> “PG&E files for bankruptcy after California wildfires”; CNN; January 29, 2019.

<sup>28</sup> “Illegal auto policy moratoriums in southland wildfire areas leads regulator to take action”; California Department of Insurance press release; December 11, 2017.

<sup>29</sup> “FAIR plan ordered to cease and desist fire insurance moratorium”; California Department of Insurance press release; December 14, 2017.

<sup>30</sup> *Senate Bill No. 824*; California Legislative Information; September 21, 2018.

<sup>31</sup> *Senate Bill No. 894*; California Legislative Information; September 21, 2018.

- For an insured that has suffered a loss from a declared state of emergency, the insurer is required to allow the insured to use the combined policy limits for primary dwelling and other structures.
- The bill was initially intended to apply retroactively to claimants of the 2017 wildfires, however it ultimately passed prospective as of Sept. 6, 2018.
- SB 917—Approved by Governor September 21, 2018. Filed with Secretary of State September 21, 2018.<sup>32</sup>
  - The bill requires coverage to be provided if losses result from a combination of perils, which includes mudslides, in the event that an insured peril such as fire is found to be an effective proximate cause.
- AB 1772—Approved by Governor September 21, 2018. Filed with Secretary of State September, 2018.<sup>33</sup>
  - The bill extends the amount of time an insured has to rebuild from two to three years after a wildfire and receive the full replacement costs.
- AB 1797 - Approved by Governor August 27, 2018. Filed with Secretary of State August 27, 2018.<sup>34</sup>
  - The bill requires that insurers provide an estimate of the cost necessary to rebuild or replace an insured structure, on an every other year basis, when providing replacement cost coverage.
- AB 1799—Approved by Governor July 9, 2018. Filed with Secretary of State July 9, 2018.<sup>35</sup>
  - Requires insurers to provide one free, full set of certified policy documents, including endorsements and the policy declarations page within 30 days of a covered loss when requested by the policyholder.
  - It was found that prior to this bill, insurers were only providing the declarations page of the policy documents or a sample policy.
- AB 1800—Approved by Governor September 21, 2018. Filed with Secretary of State September 21.<sup>36</sup>
  - In the event of a total loss, the bill clarifies the current law that an insurer must pay the full extended replacement cost coverage, when purchased by insureds, regardless whether the policyholder chooses to rebuild at the same location, rebuild at a new location, or purchase an already-built home.

<sup>32</sup> [Senate Bill 917](#); California Legislative Information; September 21, 2018.

<sup>33</sup> [Assembly Bill No. 1772](#); California Legislative Information; September 21, 2018.

<sup>34</sup> [Assembly Bill No. 1797](#); California Legislative Information; August 27, 2018.

<sup>35</sup> [Assembly Bill No. 1799](#); California Legislative Information; July 9, 2018.

<sup>36</sup> [Assembly Bill No. 1800](#); California Legislative Information; September 21, 2018.

- AB 1875—Approved by Governor September 21, 2018. Filed with Secretary of State September 21.<sup>37</sup>
  - The bill requires the Department of Insurance to establish the *California Home Insurance Finder* on its website. This is intended to help homeowners connect with an agent/broker for residential property insurance and not be left without coverage.

There are several situations—e.g., an insured is denied coverage or whose policy is canceled by an insurer—where that insurer is required to provide the insured information about the finder site.

As can be seen, much action has been taken in California as a result of the record-breaking wildfire events. Several questions come to mind that insurers, particularly when thinking about coverage in other wildfire-prone states, might ask based on these outcomes. In addition, other states might be interested in the settlement of legal challenges in California relative to wildfires, asking if the results there could be a predictor in their own jurisdictions.

When considering the mudslide losses, how much time must go by, or what other factors dictate the extent of when these losses can still be considered a proximate cause of a wildfire loss? This is a very difficult question to answer, and will probably have to be determined case by case. If a specified amount of time is stated, that amount could be appropriate in some cases but not in others. If it is based on whether or not the affected land has returned to its natural state, then it would need to be determined how that is exactly measured.

Other important questions: How will insurers react to the new public policies and decisions set in place? Will they alter their policies to try to either incorporate or anticipate the outcomes of court rulings? If not directly addressed in the policies, how might the changes impact underwriting appetite?

Actuaries could find the need to revisit their estimated and actual loss costs to determine if any of these outcomes might warrant incorporation of their resulting impacts. This can lead to the question of whether the insured is the one who is ultimately bearing the cost of the rulings meant to help provide them coverage in times of hardship.

<sup>37</sup> [Assembly Bill No. 1875](#); California Legislative Information; September 21, 2018.



The Extreme Events and Property Lines Committee of the American Academy of Actuaries offer these questions as important considerations for regulators, legislators, consumer groups, insurance companies, and distributors to consider and potentially find solutions and answers. Uncertainties in language from regulatory policies or state laws can create misalignment in expectations between all parties; therefore it is important for insurers to consider working with the states and establish clear intent on any language incorporated in insurance policies.

# Conclusions

The wildfire events of 2017 and 2018 in California, in particular, have shown the severe impact this catastrophic peril can have on people's lives and property and on the environment. In each section of this paper we discussed the current state of wildfire risk and offer a perspective on improvements over the status quo. Understanding the impacts of wildland-urban interface growth, increasing the transparency of wildfire risk, and educating people about fire prevention and mitigation can bring us closer to having more fire-resistant communities. The advancement and acceptance of wildfire modeling will help the insurers better assess the risk and offer appropriate insurance coverage to rebuild. Ensuring a clear and common understanding of wildfire legislation and regulation by all parties can aid in promoting the availability of insurance.

All stakeholders—consumers, insurers, regulators, and legislators—need to examine recent wildfire catastrophes in order to better prepare for future events.



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