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SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

LILY GILANI, individually, and on behalf of other members of the general public similarly situated; SAM GILANI, individually, and on behalf of other members of the general public similarly situated; and AMY SCHOLDER, individually, and on behalf of other members of the general public similarly situated;

Plaintiffs,

vs.

CITY OF LOS ANGELES, a government entity; CITY OF LOS ANGELES ACTING BY AND THROUGH THE LOS ANGELES DEPARTMENT OF WATER AND POWER, a government entity; CALIFORNIA NATURAL RESOURCES AGENCY, a government entity; CALIFORNIA STATE PARKS, a government entity; SANTA MONICA MOUNTAINS CONSERVANCY, a government entity; MOUNTAINS RECREATION & CONSERVATION AUTHORITY, a government entity; and DOES 1 through 100, inclusive,

Defendants.

Case No.: 25STCV19925

CLASS ACTION COMPLAINT

(1) Inverse Condemnation (Land);
(2) Inverse Condemnation (Power);
(3) Inverse Condemnation (Water);
(4) Negligence
(5) Declaratory Relief

DEMAND FOR JURY TRIAL

COMES NOW, Plaintiffs LILY GILANI, SAM GILANI, and AMY SCHOLDER (collectively, "Plaintiffs"), individually, and on behalf of other members of the general public similarly situated, and bring this action against Defendants CITY OF LOS ANGELES, a government entity, CITY OF LOS ANGELES ACTING BY AND THROUGH THE LOS ANGELES DEPARTMENT OF WATER AND POWER, a government entity, CALIFORNIA NATURAL RESOURCES AGENCY, a government entity, CALIFORNIA STATE PARKS, a government entity; SANTA MONICA MOUNTAINS CONSERVANCY, a government entity, and MOUNTAINS RECREATION & CONSERVATION AUTHORITY, a government entity, and allege, based upon information and belief and upon investigation of Plaintiffs' counsel, except for allegations specifically pertaining to Plaintiffs, which are based upon Plaintiffs' personal knowledge, as follows:

INTRODUCTION

1. This case pertains to government failures of epic proportions; where government transacted to provide services, in this case, water, power, and maintenance of public lands, and failed in doing so, causing grave harm to the people of this great state and their communities.

2. This case arises out of the fire that began on or about the morning of January 7, 2025 in the Topanga State Park in the area near the Temescal Canyon Trail and Skull Rock in the Pacific Palisades; this fire has now come to be known as the "Palisades Fire" and the worst wildfire in the history of the City of Los Angeles.

3. Plaintiffs are informed and believe that the Palisades Fire was caused by Defendants and that their actions and failures exacerbated and fomented the blaze.

4. Plaintiff LILY GILANI is a resident of Los Angeles County, who is a practicing attorney and business owner, community advocate, mother of two children, and the wife of Plaintiff SAM GILANI. Plaintiff LILY GILANI is a current and former executive of multiple companies and a former adjunct law professor. In 2014, Plaintiff LILY GILANI was a candidate for the United States House of Representatives, Congressional District No. 33, which at the time, was based in coastal Los Angeles County and included cities, communities, and districts in western Los Angeles, on the Santa Monica Bay, the Palos Verdes Peninsula, and in the Santa Monica

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Mountains, including and not limited to, the areas that were recently ravaged by the Palisades Fire. Plaintiff LILY GILANI has lived in, worked in, and advocated for these communities for over thirty-five (35) years. She has suffered damage to her real property, personal property, and business property as a result of the Palisades Fire.

5. Plaintiff SAM GILANI is a resident of Los Angeles County, who is surgeon in private practice who is a faculty member at the University of California, Los Angeles, is married to Plaintiff LILY GILANI, and is father to their two children. He has suffered damage to his real property, personal property, and business property as a result of the Palisades Fire.

Plaintiff AMY SCHOLDER is a resident of Los Angeles County, who suffered extensive loss of her real property, personal property, and business property, including and not limited to her home, contemporary art collection, and dear personal and professional archives and possessions.

6. At the time of the Palisades Fire, Plaintiffs each were residing in the County of Los Angeles. Plaintiffs' real property, which were and/or are Plaintiffs' abodes and/or places of work, as well as Plaintiffs' personal belongings and/or business property, were located in the County of Los Angeles when the Palisades Fire began, and sustained significant damages and/or were destroyed by fire and smoke. Investigation and evaluation of the extent of loss suffered by Plaintiffs is ongoing.

7. Plaintiffs and Plaintiffs' counsel are continuing to investigate to determine what other parties contributed to and/or are responsible for the Palisades Fire and the ensuing loss of life as well as loss of property, community, and human dignity.

8. Plaintiffs have retained the experienced and zealous advocates at Lawyers *for* Justice, PC to represent them and other class members Plaintiffs seek to represent, in the above-captioned action.

9. For approximately 15 years, Lawyers *for* Justice, PC has almost exclusively focused on the prosecution of class actions in state and federal courts in the State of California. Currently, Lawyers *for* Justice, PC is attorney-of-record in several hundred putative class actions that are pending in state and federal courts in the State of California. Lawyers *for* Justice, PC is comprised of over thirty-five attorneys (licensed mostly in California, but also multiple other

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states) and dozens of non-attorney staff. The firm has extensive experience litigating cases through all stages of certification, including the pre-certification, class certification, post-certification, and trial phases, and has successfully litigated and settled thousands of cases. Lawyers *for* Justice, PC has recovered hundreds of millions of dollars on behalf of hundreds of thousands of individuals in the State of California.

10. Edwin Aiwazian is the Co-Managing Attorney of Lawyers *for* Justice, PC. He received his Bachelor of Arts degree from Pepperdine University in April of 1999 and earned a Juris Doctor degree from Pepperdine University School of Law in May of 2004. He has extensive formal training in dispute resolution and negotiation from the Straus Institute for Dispute Resolution as part of its Masters in Dispute Resolution degree program. In October of 2000, he obtained a Litigation Paralegal Certificate from the UCLA Extension Program. During the summer of 2000, he studied Legal Writing at Harvard University. From approximately September 2002 to approximately December 2002, he served as a Judicial Extern to the Honorable Kim McLane Wardlaw of the United States Court of Appeals for the Ninth Circuit. From approximately June 2002 to approximately August 2002, he served as a Judicial Extern to the Honorable Earl Johnson, Jr. of the California Court of Appeal for the Second Appellate District. In December of 2004, he obtained a license to practice law from the California State Bar. Under his supervision, Lawyers *for* Justice, PC has successfully obtained class certification by contested motion practice in approximately sixteen (16) cases in the last decade and litigated over 1,000 class action or representative action cases.

11. Joanna Ghosh is the Co-Managing Attorney of Lawyers *for* Justice, PC. She received a Bachelor of Arts degree from California State University, Los Angeles in 2006, a Master of Science degree from the London School of Economics in 2007, and a Juris Doctor degree from Georgetown University Law Center in 2010. She is admitted to practice in California and in New York and is also admitted to practice in all U.S. District Courts in California, the U.S. Bankruptcy Court for the Central District of California, the U.S. Court of Appeals for the Ninth Circuit, and the U.S. Supreme Court. She has successfully handled briefing and oral argument on appeal and obtained notable decisions regarding Private Attorneys General Act claims and defense efforts to

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compel arbitration of such claims, e.g., *Roberto Betancourt v. Prudential Overall Supply* (Cal. Ct. App., Mar. 7, 2017) 9 Cal.App.5th 439, cert. denied (Cal., May 24, 2017), cert. denied (U.S., Dec. 11, 2017) and *ZB, N.A. v. Superior Court* (2019) 8 Cal.5th175. She has significant experience with class actions, including and not limited to working on cases to obtain class certification through contested motion practice and working on cases in the post-certification stage (e.g., post-certification discovery, appeal, statistical sampling and pilot study, and trial preparation in conjunction with co-counsel in a case involving a certified class consisting of thousands of individuals). She has extensive experience with class action and/or representative action settlements, and has handled this process in over five hundred (500) cases.

12. Plaintiffs are ready, with the assistance of their well-qualified counsel, to represent other victims of the Palisades Fire.

13. Plaintiffs seek to hold Defendants jointly and severally liable for damages, according to proof, but in a sum greater than $10 billion.

GENERAL ALLEGATIONS

Land

14. The Santa Monica Mountains are a coastal mountain range extending approximately 40 miles east-west from the Hollywood Hills in Los Angeles to Point Mugu in Ventura County, and contain a mixture of Federal, California State, and private land. Topanga State Park is located in the Santa Monica Mountains in and around the area known as the Pacific Palisades in Los Angeles County, and the Topanga State Park is administered and maintained by the State Defendants.

15. In light of the high risk of wildfires due to the predicted high winds and severe drought conditions in the Topanga State Park area, the CALIFORNIA NATURAL RESOURCES AGENCY, CALIFORNIA STATE PARKS, SANTA MONICA MOUNTAINS CONSERVANCY, and MOUNTAINS RECREATION CONSERVATION AUTHORITY (collectively referred to as "State Defendants") and City Defendants (defined below) have a duty to maintain vegetation and prevent any known fires on properties they own or control from escaping, damaging, or harming persons or property.

16. In California's dry season, dry, hot, powerful winds (also known as the "Santa Ana winds") blow inland from desert regions across the Mojave Desert. In a recent study published in the International Journal of Wildland Fire in August 2024, scientists estimated that fires driven by Santa Ana winds account for about 90 percent of the area burned by fall and winter wildfires in Southern California since 1950. (See **Exhibit A**).

17. Plaintiffs are informed and believe that the Defendants failed to maintain the vegetation in and around the Topanga State Park in a reasonable manner given the high risk of wildfires and allowed a known fire to escape land owned or controlled by Defendants creating the ignition of the Palisades Fire.

18. Defendants knew and were aware that Southern California experiences, and was experiencing in early January, Santa Ana winds, which are highly conducive to the rapid spread of wildfires; the winds were a regular and foreseeable circumstance, that came to fruition, in Southern California at the time of year in which the Palisades Fire ignited.

19. Defendants knew and were aware that the environment in the land and areas controlled and/or maintained by them, comprised to a large extent of chaparral (one of the most flammable vegetation complexes, consisting of dense and thick, combustible material), coupled with the presence of strong winds that cause the level of moisture to drop, posed an additional risk of fire.

20. Defendants knew and were aware of the foreseeable danger of wildfire as a result of their electrical systems or other ignition sources coming into contact with vegetation in areas owned, controlled, and/or managed by them.

21. Defendants knew that they had to maintain lands controlled by them and surrounding vegetation in compliance with applicable regulations, and that their failure to do so constituted negligence and would expose Plaintiffs and other class members to a serious risk of property and non-property, economic and non-economic damages and losses caused by wildfires.

22. For several years, Defendants have known that their miles of overgrown vegetation pose a serious safety risk of triggering wildfires, a risk that has, unfortunately, materialized on several occasions.

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23. From approximately December 17, 2024 to January 7, 2025, the U.S. Drought Monitor, which is produced jointly by the National Drought Mitigation Center (NDMC) at the University of Nebraska-Lincoln, the National Oceanic and Atmospheric Administration (NOAA), and the U.S. Department of Agriculture (USDA), categorized areas in Los Angeles County, including the Topanga State Park area (which contains a large amount of chaparral), as being abnormally dry or in a "Severe Drought."

24. Chaparral is widely known to burn underground without visible flames for weeks after being subjected to fire and was the source of multiple flare-ups for nearly a week after the 2019 Getty Fire.

25. Plaintiffs are informed and believe that on or about January 1, 2025, a fire was started in Topanga State Park in the area near Temescal Canyon Trail ("New Years Fire"), which was believed to have been put out.

26. Plaintiffs are informed and believe that Defendants did not ensure fire would not escape their land.

27. Defendants did not stage any firefighting assets in or around the vicinity of the New Years Fire, in Topanga State Park, to observe or interdict any flare-ups that might occur due to the extreme wind conditions, severe drought conditions, and possibility of underground Chaparral embers.

28. Plaintiffs are informed and believe, and based thereon allege, that in the week leading up to the Palisades Fire, the National Weather Service issued multiple "Red Flag" and "High Wind Warnings" for Los Angeles County, including the Topanga State Park area, with the most severe weather occurring January 7, 2025. For example, on January 3, 2025, National Weather Service Los Angeles issued a public alert regarding dangerously strong wind conditions, noted the potential for wildfires, and issued a Fire Weather Watch alert in Los Angeles and Ventura counties, and on January 5, 2025, National Weather Service Los Angeles issued a Red Flag and High Wind Warning to citizens in Los Angeles and Ventura counties. On January 6, 2025, National Weather Service Los Angeles issued several alerts relating to much of Los Angeles and Ventura Counties, warning of low humidity and very dry vegetation; that widespread damaging

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winds and low humidities will likely cause fire starts to rapidly grow in size with extreme fire behavior; that extreme caution should be used with any potential ignition sources; to expect downed trees and power outages; and that there would be life threatening, destructive, and dangerous weather conditions. (See **Exhibit B and Exhibit C**).

29. On January 7, 2025, the forecasted and predicted, historically strong winds arrived in and around the Topanga State Park area, a "high risk" fire area due to the extremely dry conditions and high amounts of flammable vegetation.

30. Plaintiffs are informed and believe that the Palisades Fire started at approximately 10:30 a.m. on January 7, 2025.

Water

31. Plaintiffs are informed and believe that the City of Los Angeles ("City") and Los Angeles Department of Water and Power ("LADWP") (together, "City Defendants") failed to maintain their water system, and the failure to do so and the failure of the system was a substantial factor in the continued growth and spread of the Palisades Fire, causing Plaintiffs and other class members to suffer the tremendous damages and loss alleged.

32. As the Palisades Fire quickly spread three (3) of City Defendants' tanks each holding approximately one million gallons of water went dry within a span of 12 hours: the first tank ran out of water by approximately the afternoon of January 7, 2025, the second tank ran out of water by approximately the evening of that same day, and the third tank ran out of water by approximately the early morning on January 8, 2025.

33. According to news media sources and radio traffic of the Los Angeles Fire Department, fire hydrants lost water pressure in the Pacific Palisades during the battle against the Palisades Fire.

34. Plaintiffs are informed and believe that City Defendants' water reservoirs failed during the fire and that this failure was the result of City Defendants' decision to forgo proper maintenance and repair of the cover on the Santa Ynez Reservoir as a cost saving decision, which was an inherent risk of this public improvement as deliberately designed, constructed and maintained by City Defendants.

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35. At the time the Palisades Fire erupted the Santa Ynez Reservoir, a 117- million-gallon water storage complex, was empty, having been out of commission since February of 2024, awaiting repairs to its cover; additionally, the neighboring Chautauqua Reservoir (also known as the Palisades Reservoir), was reportedly empty, having been drained during the summer of 2024 for repairs.

36. These reservoirs were a vital necessity to the public. The Santa Ynez Reservoir was built to provide a critical public use – fire protection; to accommodate growth in Pacific Palisades, the LADWP built the Santa Ynez Reservoir in Santa Ynez Canyon, as well as a pumping station to increase fire protection.

37. The Santa Ynez Reservoir was taken out of commission in February of 2024 by the LADWP, after a tear in the floating cover measuring several feet was discovered. As of the date of the Palisades Fire, the required repair work had not been completed, and the Santa Ynez Reservoir remained empty.

38. The Palisades Reservoir was taken offline in mid-2024, at which point it was drained, cleaned, and subject to planned refurbishment, however, it was not put back into service and remained empty at the time of the Palisades Fire.

39. The empty reservoirs left fire crews little to no water and reduced water pressure, to fight the Palisades Fire.

40. According to City Defendants' Emergency Operations Plan, Dam/Reservoir Failure Manual, the "LADWP will maintain water supply to the distribution system for fire suppression and customer needs."[1]

41. According to City Defendants' Emergency Operations Plan, Critical Infrastructure Manual, a "failure of one critical infrastructure can potentially have a domino effect causing other critical infrastructures to fail as well. For example, a severe disruption to the power supply can affect the water pressure caused by inoperable pumps, thus contaminating the City's water supply. A prolonged interruption and a delayed recovery response to critical infrastructures in the City of

[1] Accessible at: https://emergency.lacity.gov/sites/g/files/wph1791/files/2022-09/Dam%20Reservoir%20Failure%202019.pdf

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Los Angeles will pose a significant threat to the health, safety, and property of its residents."[2]

42. Plaintiffs are informed and believe that City Defendants knew about the significant risk wildfires posed in the event of ineffective infrastructure management, delayed repairs, unsafe equipment, and/or aging infrastructure decades before the Palisades Fire.

43. The destruction, damages, and losses from the Palisades Fire are sufficiently connected with the public use of City Defendants' water system, since such injuries are a result of dangers inherent in the design, construction, and maintenance of the water system.

44. City Defendants made the deliberate decision to forgo regular monitoring and timely repair of the reservoirs, leaving both the Santa Ynez Reservoir and Palisades Reservoir drained and unusable, to save money.

45. Plaintiffs are informed and believe that City Defendants' own policy calls for repairs to the Santa Ynez Reservoir to have been addressed within 48 hours of discovery, and City Defendants failed to do so.

46. City Defendants' Emergency Operations Plan, Critical Infrastructure Manual further mandates that City Defendants "[e]stablish alternate water supply as needed" and "[m]ake necessary service repairs to restore water service[,]" however, City Defendants made a choice to decline to pursue reasonable maintenance and repair programs for the reservoir.

47. City Defendants failed to comply with their own policies and guidelines, and to meet their own target metrics, to inspect, assess, and remediate issues with the reservoirs and water system.

48. City Defendants' acts and omissions, including and not limited to, their decision to forgo maintenance and/or operation of the Santa Ynez Reservoir and Palisades Reservoir, were a substantial factor in causing Plaintiffs and the other class members to suffer the losses alleged in this Complaint.

49. On January 10, 2025, when calling for an independent investigation of City Defendants over the loss of water pressure and their deliberate shut down of the Santa Ynez Reservoir, California Governor Gavin Newsom acknowledged that the loss of water pressure

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[2] Accessible at: https://emergency.lacity.gov/sites/g/files/wph1791/files/2021-04/critical_infrastructure_2018_0.pdf

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"likely impaired" the ability to protect homes and evacuation corridors in Pacific Palisades.

50. Plaintiffs are informed and believe that City Defendants deliberately designed and maintained a defective water supply system, despite the system being located in and serving a fire-prone area, and despite knowledge of a long history of wildfires (i.e., at least 30 wildfires in the last 90 years) having scorched the area, causing thousands of acres to burn, destroying thousands of structures, loss of life, and evacuations of hundreds of thousands of people, within the last decade (e.g., the Franklin Fire in December 2023 and Woolsey Fire in November 2018). (See **Exhibit B**).

51. Plaintiffs are informed and believe that had the reservoirs been full of water and in proper working service, and had the City Defendants adequately designed and maintained their water supply system, water pressure in Pacific Palisades would have "lasted longer" and there would have been less suffering, loss, and damage to Plaintiffs, other class members, and their communities.

Electricity

52. Plaintiffs are informed and believe that LADWP electrical equipment and downed energized powerlines created and were another source or ignition for the Palisades Fire, above City Defendants' Temescal Water Tank on the Temescal Canyon Trail, which quickly consumed homes and quickly spread through Pacific Palisades, Malibu, and surrounding areas.

53. Plaintiffs are informed and believe that City Defendants' surveillance cameras captured the start of this ignition directly above The Summit neighborhood in the evening of January 7, 2025.

54. The electrical lines that failed and ignited additional fire(s) that were a part of the Palisades Fire were owned and controlled by City Defendants.

55. Plaintiffs are informed and believe that, on the evening of January 7, 2025, wood power poles located above City Defendants' Temescal Water Tank on the Temescal Canyon Trail, which were owned, controlled, operated and maintained by City Defendants, broke during the high-wind event causing energized sub-transmission powerlines to fall into heavy vegetation below, igniting a fire.

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56. The referenced power transmission lines were still energized even though City Defendants should have cut their power due to high winds. City Defendants failed to shut down power to the referenced electrical distribution lines even though they had multiple, prior warnings of high winds and was actively aware of high winds.

57. City Defendants knew of the wind and fire dangers, but they failed to de-energize their electrical lines and to maintain vegetation which would be necessary to avoid the high risk of fire.

58. As of at least January 7, 2025, City Defendants knew there was an elevated fire risk in locations where their electrical equipment is located in the City of Los Angeles, including in the Pacific Palisades area.

59. City Defendants are aware of the dangerous and hazardous nature of their electrical infrastructure, and City Defendants have a duty to exercise an increased level of care to protect the citizens and areas surrounding their electrical infrastructure.

60. Plaintiffs are further informed and believe that additional spot fires ignited and accelerated the rapid spread of the Palisades Fire because City Defendants did not de-energize their electrical system, overhead power lines arcing and power poles breaking sending energized power lines falling to the ground into fuel beds that ignited additional spot fires that rapidly spread and expanded the Palisades Fire. Specifically, City Defendants' failure to de-energize caused arcing and exploding transformers and sent sparks and molten metal showering down onto homes, businesses, and vegetation, and sparked pole fires (e.g., on the afternoon of January 7, 2025, at 17015 Pacific Coast Highway in front of the Malibu Village mobile home park), which caused additional ignitions of fire.

61. City Defendants have a duty to properly and safely construct, inspect, repair, maintain, manage, and/or operate their electrical infrastructure, but failed to do so, and their failure was a substantial factor causing the spread of the Palisades Fire.

62. City Defendants failed to perform the necessary assessment, inspection, remediation, and maintenance of their electrical equipment and system.

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63. City Defendants have a duty to implement policies and procedures that safeguard the public from the risk of fire caused by their electrical infrastructure, including during an adverse weather event, including, but not limited to, de-energizing their electrical lines to prevent fire, properly maintaining equipment, and removing vegetation from around their electrical equipment.

Losses

64. Defendants caused and are liable for heart-wrenching tragedy and loss, including death, physical injuries, extreme danger, severe trauma, and extensive property and non-property damages and losses suffered by Plaintiffs and/or other class members.

65. Plaintiffs are informed and believe that the Palisades Fire burned approximately 23,707 acres, destroyed approximately 6,837 structures, damaged countless other structures, killed approximately 12 civilians, and injured several civilians and a firefighter.

66. Plaintiffs are informed and believe that, as of January 8, 2025, at least 30,000 people were forced to evacuate their homes and business, with many more under evacuation orders, due to the Palisades Fire. (**Exhibit D**)

67. The Palisades Fire also created serious air quality problems in Pacific Palisades, Malibu, Topanga Canyon, Brentwood, and surrounding areas, and caused extensive environmental damage and contamination of Plaintiffs and other class members' real, personal, and/or business properties with smoke, lead, asbestos, and other heavy metals and hazardous materials.

68. The full extent of the damage has not yet been quantified.

69. The fire damage and destruction have also negatively impacted the value of Plaintiffs' and other class members' real, personal, and/or business property and will continue to affect their resale value and development for an indefinite period of time in the future.

70. In addition to damage and destruction of real, personal, and/or business property, the Palisades Fire caused widespread economic losses to individuals and businesses throughout Los Angeles and will continue to do so into the future.

71. Individuals who were displaced have incurred and will continue to incur costs related to temporary lodging while being displaced.

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72. Businesses that suffered property damage have incurred and will continue to incur economic losses due to their inability to operate their businesses due to property damage from fire, smoke, and soot.

73. As a result of the Palisades Fire, sewer, power, transit and road, and water infrastructures have been damaged and will need to be repaired and reconstructed. It is also expected that there will be short-term and long-term effects on employment, productivity, and job growth, and business. Further, it is expected that there will be adverse health conditions due to wildfire smoke, particulate matter and debris in the air (from the burning of houses and businesses and their contents, as opposed to mere burning of vegetation), and water contamination, including and not limited to, asthma and other respiratory conditions, cancer, and preterm births. (See **Exhibit E**).

74. Advisories and instructions were issued to Plaintiffs and other class members in the aftermath of the Palisades Fire, because water was and has been polluted due to chemical contaminants as a result of the Palisades Fire, posing danger to public health and safety in several communities.

75. Specifically, when water systems lose pressure during urban wildfires, as was the case with City Defendants' water system in connection with the Palisades Fire, this allows bacteria, chemicals, and other contaminants such as volatile organic compounds (e.g., benzene) to get into and contaminate the water in the form of smoke, soot, ash, or gas intrusion. Furthermore, when pipes and plumbing materials and the structures and contents of homes and businesses melt and burn, this results in toxic waste, debris, and vapor being released, which in turn further compromises water systems and results in toxic runoff and contamination (e.g., when there is rain). (See **Exhibit F** and **Exhibit G**).

76. For example, on January 10, 2025, City Defendants issued their own Unsafe Water Alert, instructing consumers not to drink tap water in Pacific Palisades, zip code 90272, and adjacent communities in the LADWP service area that is north of San Vicente Boulevard, due to potential of fire-related contaminants, including benzene and other volatile organic compounds that may have entered the water system. (See **Exhibit H**).

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77. In the aftermath of the Palisades Fire, Los Angeles public health officials were forced to shut down beaches near burn areas and issue warnings, including and not limited to, following rains, due to the presence of toxic debris, substances, and contaminants in the water posing a risk to both humans and marine life.

78. As such, the Palisades Fire has negatively impacted public safety and environmental safety and has imposed, and will continue to impose, significant annoyance, loss of enjoyment, danger, loss of life and/or reduction in life span, and monetary loss on Plaintiffs, other class members, and their communities, for years to come.

79. Outspoken community activists and critics have blamed City Defendants for inadequately filling reservoirs, failing to undertake basic duties such as removing brush from hills overlooking the metropolis, "chronic under-investment" in infrastructure, and overall "absolute mismanagement" of infrastructure, which in turn caused the Palisades Fire and allowed it to spread, likening the City Defendants' conduct to that of a "third-world country". (**See Exhibit I**).

80. AccuWeather estimated total damage and economic loss to the people and economy in Southern California, relating to the January 2025 fires in Los Angeles, due to what has occurred and what is to come, to be well in excess of $50 billion, and somewhere in the range of $250 billion and $275 billion. AccuWeather's estimate takes into account the damage and destruction of thousands of homes and businesses, damage to utilities and infrastructure, including contamination of water systems from debris, business disruptions and other impacts on commerce, the financial impact of evacuation orders for more than 100,000 people, lost wages, the long-term cost of rebuilding or relocation for people in densely populated areas whose homes were destroyed, anticipated cleanup and recovery costs, emergency shelter expenses and housing displacement, hospital evacuations, as well as immediate and long-term health care costs for people who were injured or exposed to unhealthy air quality from wildfire smoke, both locally and nationally. (See **Exhibit J** and **Exhibit K**).

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JURISDICTION AND VENUE

81. This class action is brought pursuant to the California Code of Civil Procedure section 382.

82. The monetary damages and restitution sought by Plaintiffs exceed the minimal jurisdiction limits of the Superior Court and will be established according to proof at trial.

83. This Court has jurisdiction over this action pursuant California Code of Civil Procedure section 395 and 395.5, because Defendants have conducted significant business in the County of Los Angeles and their wrongful acts and negligence took place in the County of Los Angeles. This Court has jurisdiction over Defendants because, upon information and belief, Defendants are governmental entities in California, citizens of California, have sufficient minimum contacts in California, or otherwise intentionally avail themselves of the California market so as to render the exercise of jurisdiction over them by California courts consistent with traditional notions of fair play and substantial justice. The amount in controversy exceeds the jurisdictional minimum of this Court.

84. Venue is proper in this Court because, upon information and belief, Defendants maintain offices, have agents, employ individuals, and/or transact business in the State of California, County of Los Angeles. Furthermore, the facts, acts, events, omissions, and circumstances alleged herein, relating to Plaintiffs and other class members, occurred in the County of Los Angeles, State of California.

85. At all relevant times, Defendants either maintained their headquarters/"nerve center" within the State of California, County of Los Angeles or otherwise purposefully availed themselves of the County of Los Angeles, State of California, doing business in said County, State of California.

PARTIES

86. Plaintiff LILY GILANI is an individual residing in the State of California, County of Los Angeles, who at the time of the Palisades Fire, resided at, conducted business at, had personal and/or business belongings and property at, and/or a personal and/or business interest in property within the vicinity of the Palisades Fire, who suffered injuries, damages, losses, emotional

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distress, harm, and other damages because of the Palisades Fire.

87. Plaintiff SAM GILANI is an individual residing in the State of California, County of Los Angeles, who at the time of the Palisades Fire, resided at, conducted business at, had personal and/or business belongings and property at, and/or a personal and/or business interest in property within the vicinity of the Palisades Fire, who suffered injuries, damages, losses, emotional distress, harm, and other damages because of the Palisades Fire.

88. Plaintiff AMY SCHOLDER is an individual residing in the State of California, County of Los Angeles, who at the time of the Palisades Fire, resided at, conducted business at, had personal and/or business belongings and property at, and/or a personal and/or business interest in property within the vicinity of the Palisades Fire, who suffered injuries, damages, losses, emotional distress, harm, and other damages because of the Palisades Fire.

89. Plaintiffs and other class members suffered damages including but not limited to: damage to or destruction of real property, personal property, and/or business property; loss of and/or interference with occupancy and/or possession; loss of, impairment of, and/or interference with access or use of property; displacement; loss of quiet enjoyment of property; reputational damage; diminished value of property; disruption of use and enjoyment of property; deprivation of all economically viable use for property; damage to and/or loss of cherished possessions; lost wages; loss of earning capacity; loss of business income and/or goodwill; out-of-pocket expenses directly and proximately incurred because of the Palisades Fire; alternative living expenses; evacuation expenses; transportation expenses; personal injuries; and medical bills; and various types of emotional distress, annoyance, inconvenience, disturbance, mental anguish and loss of quiet enjoyment of property.

90. Plaintiffs and other class members were, at all times herein mentioned, homeowners, property owners, landlords, tenants, sublessees, renters, evacuees, businesses, business owners, and other individuals and entities who have suffered and/or continue to suffer personal injuries, property losses, and/or other damages from the Palisades Fire.

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91. Defendants CITY OF LOS ANGELES ("City"), LADWP, and State Defendnants, at all times herein mentioned, upon information and belief, are governmental entities authorized to do business and doing business in the State of California.

92. Defendant LADWP, at all times herein mentioned, was the municipal utility for the City of Los Angeles (together, the City and LADWP are referred to as "City Defendants"), headquartered in Los Angeles County, responsible for installing, constructing, building, maintaining, and operating electrical and water infrastructures and systems in and around the location of the origin of and/or additional ignition points of the Palisades Fire.

93. Defendant CALIFORNIA NATURAL RESOURCES AGENCY, at all times herein mentioned, was the public entity responsible for overseeing the administration of the Santa Monica Mountains, located in the County of Los Angeles, State of California

94. Defendant CALIFORNIA STATE PARKS, at all times herein mentioned, was the public entity in charge of administering the California State Park system for the State of California, in the Santa Monica Mountains, located in the County of Los Angeles, State of California.

95. Defendant SANTA MONICA MOUNTAINS CONSERVANCY, at all times herein mentioned, was the public entity in charge of administering the Santa Monica Mountains, located in the County of Los Angeles, for the CALIFORNIA NATURAL RESOURCES AGENCY for the State of California.

96. Defendant MOUNTAINS RECREATION CONSERVATION AUTHORITY, at all times herein mentioned, was the local public entity in charge of administering the Santa Monica Mountains, located in the County of Los Angeles, with their principal place of business in the County of Los Angeles, State of California.

97. At all times herein relevant, City Defendants, State Defendants, and DOES 1 through 100, and each of them, were the agents, partners, joint venturers, joint employers, representatives, servants, employees, successors-in-interest, co-conspirators, and/or assigns of each other, and at all times relevant hereto, were acting within the course and scope of their authority as such agents, partners, joint venturers, joint employers, representatives, servants, employees, successors, co-conspirators, and/or assigns, and all acts or omissions alleged herein

were duly committed with the ratification, knowledge, permission, encouragement, authorization, and/or consent of each defendant designated as a DOE herein.

98. The true names and capacities, whether corporate, associate, individual, or otherwise, of defendants DOES 1 through 100, inclusive, are unknown to Plaintiffs who sue said defendants by such fictitious names. Plaintiffs are informed and believe, and based on that information and belief, allege that each of the defendants designated as a DOE is legally responsible for the events and happenings referred to in this Complaint and unlawfully caused the injuries and damages to Plaintiffs and other class members as alleged in this Complaint. Plaintiffs will seek leave of court to amend this Complaint to show the true names and capacities when the same have been ascertained.

99. City Defendant, State Defendants, and DOES 1 through 100 will hereinafter collectively be referred to as "Defendants."

100. Plaintiffs are informed and believe that Defendants here, and each of them, were agents and/or employees each of the other and in acting and/or failing to act as alleged herein, the Defendants, and each of them, were acting in the course and scope of the agency and/or employment relationship.

101. Plaintiffs are informed and believe that Defendants are jointly and severally liable for each other's negligence, misconduct, and wrongdoing, as alleged herein.

102. Plaintiffs and class members have and/or will file notices with Defendants consistent with California Government Code § 910, *et seq*., and will amend this Complaint once their claims have either been denied by Defendants or the time to respond to their claims has expired by operation of law.

CLASS ACTION ALLEGATIONS

103. Plaintiffs bring this action on behalf of themselves and on behalf of all other members of the general public similarly situated and thus seeks class certification under California Code of Civil Procedure section 382.

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104. The proposed class is defined as follows:

> All individuals and/or legal entities, including and not limited to, homeowners, property owners, renters, evacuees, businesses, business owners, and other individuals and entities who have suffered and/or continue to suffer injuries, losses, and/or other damages, including and not limited to, damages to their real property, personal property, and/or businesses, from the Palisades Fire, at any time during the period from January 7, 2025 to final judgment.

105. Plaintiffs reserve the right to establish subclasses as appropriate.

106. The class is ascertainable, and there is a well-defined community of interest in the litigation:

a. Numerosity: The class members are so numerous that joinder of all class members is impracticable. The membership of the entire class is unknown to Plaintiffs at this time; however, the class is estimated to be greater than five thousand (5,000) class members, and the identity of such membership is readily ascertainable by multiple means, including and not limited to, Defendants' business records and public records (e.g., records regarding water and power service accounts, taxes, registrations, evacuation or damage, and affected properties).

b. Typicality: Plaintiffs' claims are typical of all other class members' as demonstrated herein. Plaintiffs will fairly and adequately protect the interests of other class members with whom Plaintiffs have a well-defined community of interest.

c. Adequacy: Plaintiffs will fairly and adequately protect the interests of each class member, with whom they have a well-defined community of interest and typicality of claims, as demonstrated herein. Plaintiffs have no interest that is antagonistic to other class members. Plaintiffs' attorneys, the

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proposed class counsel, are versed in the rules governing class action discovery, certification, and settlement. Plaintiffs have incurred, and during the pendency of this action will continue to incur, costs and/or attorneys' fees that have been, are, and will be necessarily expended for the prosecution of this action for the substantial benefit of each class member.

d. Superiority: A class action is superior to other available methods for the fair and efficient adjudication of this litigation because individual joinder of all class members is impractical.

e. Public Policy Considerations: Certification of this lawsuit as a class action will advance public policy objectives of efficiently adjudicating the claims of a large group of individuals who are all victims of the same disaster, and facilitating their recovery of compensation and other relief, while also addressing issues of great public concern regarding health and safety.

107. There are common questions of law and fact as to the class members that predominate over questions affecting only individual members. The following common questions of law or fact, among others, exist as to the members of the class:

a. Whether Defendants violated the applicable statutory, regulatory, reasonable, and/or professional standards of care;

b. Whether Defendants failed to replace and modernize their water, electrical, and land management infrastructures (i.e., equipment, facilities, systems, etc.), and bring their operations into compliance with modern standards, use, and needs, to protect public safety;

c. Whether Defendants willfully disregarded that known, chronic, and enduring problems in their water, electrical, and land management infrastructures posed high safety risk to the people and businesses in the area of the Palisades Fire;

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d. Whether Defendants failed to meet their obligations to furnish and maintain adequate, efficient, just, and reasonable services, instrumentalities, equipment, and facilities as are necessary to promote the safety, health, comfort, and convenience of their patrons, employees, and the public, as required by law;

e. Whether Defendants failed to comply with design and safety standards for their electrical equipment, as required by law;

f. Whether Defendants failed to engage in adequate vegetation management, including and not limited to, near publicly-accessible trails and areas and power lines and equipment, to prevent the foreseeable danger of fire, and to comply with standards to protect the public from the hazards of overgrown vegetation, as required by law;

g. Whether Defendants failed to perform required inspections of trails and other areas under their control and/or maintenance, and/or their facilities, equipment, and systems, as required by law;

h. Whether Defendants failed to timely and properly maintain, manage, inspect, and/or monitor trails and other areas under their control and/or maintenance, and/or power lines, electrical equipment, and/or adjacent vegetation;

i. Whether Defendants failed properly cut, trim, prune, and/or otherwise keep vegetation at a sufficient distance to avoid foreseeable contact with power lines or other ignition sources;

j. Whether Defendants failed to trim and/or prune vegetation to avoid creation of a safety hazard within close proximity of publicly-accessible trails and areas and/or power lines;

k. Whether Defendants failed to conduct adequate, reasonably prompt, proper, effective, and/or frequent inspections of the electrical transmission lines, wires, and/or associated equipment;

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l. Whether Defendants failed to design, construct, monitor, and/or maintain high voltage electrical transmission, and/or distribution power lines so they avoid the potential to ignite a fire during long, dry seasons by allowing vegetation to grow in an unsafe manner;

m. Whether Defendants failed to install the equipment necessary and/or to inspect and repair the equipment installed, to prevent electrical transmission and distribution lines from improperly sagging, operating, and/or contacting other metal wires placed on poles and igniting fires;

n. Whether Defendants failed to maintain lands within their control and maintenance in a safe condition and/or manage them to prevent fire;

o. Whether Defendants failed to keep equipment in a safe condition and/or manage equipment to prevent fire;

p. Whether Defendants failed to deenergize power lines during fire-prone conditions;

q. Whether Defendants failed to deenergize power lines after the ignition of the Palisades Fire;

r. Whether Defendants failed to properly train and to supervise employees and agents responsible for maintenance and inspection of power lines, vegetation areas nearby power lines, and/or vegetation nearby publicly accessible trails and areas;

s. Whether Defendants failed to ensure enough water reserves given known fire risks;

t. Whether Defendants' acts and omissions were a proximate cause of the destruction and damage to class members' real and personal property;

u. Whether Defendants violated statutory and constitutional provisions, including, *inter alia*, Article I, Section 19 of the California Constitution;

v. Whether Defendants are liable for damages under theories of negligence and inverse condemnation; and

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w. Whether Defendants are entitled to equitable, injunctive, or declaratory relief to redress ongoing and imminent harms arising from the unsafe operation of Defendants' public infrastructure.

FIRST CAUSE OF ACTION

Inverse Condemnation (Land)

(Against Defendants CITY OF LOS ANGELES, a government entity, CITY OF LOS ANGELES ACTING BY AND THROUGH THE LOS ANGELES DEPARTMENT OF WATER AND POWER, a government entity, CALIFORNIA NATURAL RESOURCES AGENCY, a government entity, CALIFORNIA STATE PARKS, a government entity; SANTA MONICA MOUNTAINS CONSERVANCY, a government entity, and MOUNTAINS RECREATION & CONSERVATION AUTHORITY, a government entity, and DOES 1 through 100)

108. Plaintiffs incorporate by reference the allegations contained in the paragraphs above, and each and every part thereof with the same force and effect as though fully set forth herein.

109. At all relevant times mentioned herein, Plaintiffs and other class members suffered losses and damage to their real property, personal property, and/or business property as a result of the Palisades Fire and the acts and omissions of Defendants.

110. Prior to January 7, 2025, Defendants owned, operated, controlled, maintained, used, and/or supplied the Santa Monica Mountains, including Topanga State Park, and other areas that burned during the Palisades Fire.

111. As a direct, necessary and substantial result of Defendants' improper ownership, operation, control, maintenance, use, and/or supply of a public land, Topanga State Park, vast amounts of mature, dry chaparral were allowed to overgrow in and/or around the Temescal Canyon Trail near Skull Rock, where the Palisades Fire began.

112. Despite Defendants being aware that chaparral burns underground without visible flames for weeks after being subjected to fire, and knowing a fire had started on January 1, 2025, causing the chaparral to continue burning for days afterward, Defendants failed to contain the

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Palisades Fire from occurring on their land, allowing it to escape into the neighboring area, causing devastating destruction and loss to Plaintiffs, other class members, and their communities.

113. Article I, Section 19 of the California Constitution provides the basis for recovery against government entities and public utilities via the theory of inverse condemnation when private property is taken or damaged for a public use without just compensation to the owner.

114. Defendants caused or worsened the damage and destruction of Plaintiffs and other class members' real property, personal property, and business property.

115. The damage and loss to Plaintiffs and other class members was proximately and substantially caused by Defendants' actions in that Defendants' ownership, operation, control, maintenance, use, and/or supply for public use of their lands, caused or worsened the damage and/or loss sustained by Plaintiffs and other class members.

116. Plaintiffs and other class members have not received adequate compensation for the damage to and/or destruction of their property, thus constituting a taking or damaging of Plaintiffs and other class members' property by Defendants without just compensation, thereby unlawfully infringing on property interests protected by the Fifth Amendment to the United States Constitution and Article I, Section 19, of the California Constitution.

117. Plaintiffs and other class members are entitled to, and seek, damages in an amount according to proof at trial, as well as attorney fees and prejudgment interest in accordance with California Code of Civil Procedure § 1036.

SECOND CAUSE OF ACTION

Inverse Condemnation (Power)

(Against Defendants CITY OF LOS ANGELES, a government entity, CITY OF LOS ANGELES ACTING BY AND THROUGH THE LOS ANGELES DEPARTMENT OF WATER AND POWER, a government entity, and DOES 1 through 100)

118. Plaintiffs incorporate by reference the allegations contained in the paragraphs above, and each and every part thereof with the same force and effect as though fully set forth herein.

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119. At all relevant times mentioned herein, Plaintiffs and other class members suffered losses and damage to their real property, personal property, and/or business property as a result of the Palisades Fire and the acts and omissions of City Defendants.

120. Prior to January 7, 2025, City Defendants designed, installed, constructed, owned, operated, used, controlled, supplied, and/or maintained electrical infrastructure servicing areas where Plaintiffs and other class members were either themselves located or where their property was located.

121. As a direct, necessary and substantial result of City Defendants' improper design, installation, construction, ownership, operation, use, control, and/or maintenance for a public use of their electrical infrastructure, City Defendants' energized electrical lines and electrical equipment ignited fires of flammable vegetation (in some cases allowed to overgrow) and sent sparks showering upon houses and business, and these fires expanded and prolonged the Palisades Fire.

122. Under California Public Utilities Code § 216(a)(1), an *electrical corporation* or *water corporation* is a public utility if the service is performed for, or the commodity is delivered to, the public or any portion thereof. Cal. Pub. Util. Code § 216(a)(1). At all times mentioned herein, Defendant LADWP, an agent or subdivision of Defendant City, was and is a public utility supplying water and electricity for public use in the City of Los Angeles during the Palisades Fire.

123. Article I, Section 19 of the California Constitution provides the basis for recovery against government entities and public utilities via the theory of inverse condemnation when private property is taken or damaged for a public use without just compensation to the owner.

124. City Defendants caused or worsened the damage and destruction of Plaintiffs and other class members' real property, personal property, and business property.

125. The damage and loss to Plaintiffs and other class members was proximately and substantially caused by City Defendants' actions in that City Defendants' improper design, installation, construction, ownership, operation, use, control, and/or maintenance for a public use of their electrical infrastructure, caused or worsened the damage and/or loss sustained by Plaintiffs and other class members.

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126. Plaintiffs and other class members have not received adequate compensation for the damage to and/or destruction of their property, thus constituting a taking or damaging of Plaintiffs and other class members' property by City Defendants without just compensation, thereby unlawfully infringing on property interests protected by the Fifth Amendment to the United States Constitution and Article I, Section 19, of the California Constitution.

127. Plaintiffs and other class members are entitled to, and seek, damages in an amount according to proof at trial, as well as attorney fees and prejudgment interest in accordance with California Code of Civil Procedure § 1036.

THIRD CAUSE OF ACTION

Inverse Condemnation (Water)

(Against Defendants CITY OF LOS ANGELES, a government entity, CITY OF LOS ANGELES ACTING BY AND THROUGH THE LOS ANGELES DEPARTMENT OF WATER AND POWER, a government entity, and DOES 1 through 100)

128. Plaintiffs incorporate by reference the allegations contained in the paragraphs above, and each and every part thereof with the same force and effect as though fully set forth herein.

129. At all relevant times mentioned herein, Plaintiffs and other class members suffered losses and damage to their real property, personal property, and/or business property as a result of the Palisades Fire and the acts and omissions of City Defendants.

130. Prior to January 7, 2025, City Defendants designed, installed, constructed, owned, operated, used, controlled, supplied, and/or maintained the Santa Ynez Reservoir and Palisades Reservoir servicing areas where Plaintiffs and other class members were either themselves located or where their property was located.

131. As a direct, necessary and substantial result of City Defendants' improper design, installation, construction, ownership, operation, use, control, and/or maintenance for a public use of their water infrastructure, including and not limited to, the Santa Ynez Reservoir and Palisades Reservoir, fire hydrants lost water pressure and ran dry, causing or worsening the damage and destruction to Plaintiffs and other class members' real property, personal property, and/or business

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property.

132. As a direct, necessary, and legal result of City Defendants' deliberate decision to drain and delay repairs of their water infrastructure, including and not limited to, the Santa Ynez Reservoir and Palisades Reservoirs as part of, City Defendants caused or worsened the damage and destruction of Plaintiffs and other class members' real property, personal property, and business property.

133. Plaintiffs are informed and believe that the Sana Ynez Reservoir and Palisades Reservoirs were out of service prior to the Palisades fire and that this failure was the result of City Defendants' deliberate decision to forgo proper maintenance on the reservoirs to save money, which was an inherent risk of this public improvement as deliberately designed, constructed and maintained by City Defendants.

134. City Defendants water infrastructure is a public improvement for public use and constitutes a "Water System" pursuant to California Public Utilities Code § 240.

135. Under California Public Utilities Code § 216(a)(1), an *electrical corporation* or *water corporation* is a public utility if the service is performed for, or the commodity is delivered to, the public or any portion thereof. Cal. Pub. Util. Code § 216(a)(1). At all times mentioned herein, Defendant LADWP, an agent or subdivision of Defendant City, was and is a public utility supplying water and electricity for public use in the City of Los Angeles during the Palisades Fire.

136. Article I, Section 19 of the California Constitution provides the basis for recovery against government entities and public utilities via the theory of inverse condemnation when private property is taken or damaged for a public use without just compensation to the owner.

137. The damage and loss to Plaintiffs and other class members was proximately and substantially caused by City Defendants' actions in that City Defendants' improper design, installation, construction, ownership, operation, use, control, and/or maintenance for a public use of their water infrastructure, caused or worsened the damage and/or loss sustained by Plaintiffs and other class members.

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138. Plaintiffs and other class members have not received adequate compensation for the damage to and/or destruction of their property, thus constituting a taking or damaging of Plaintiffs and other class members' property by City Defendants without just compensation, thereby unlawfully infringing on property interests protected by the Fifth Amendment to the United States Constitution and Article I, Section 19, of the California Constitution.

139. Plaintiffs and other class members are entitled to, and seek, damages in an amount according to proof at trial, as well as attorney fees and prejudgment interest in accordance with California Code of Civil Procedure § 1036.

FOURTH CAUSE OF ACTION

Negligence

(Against Defendants CITY OF LOS ANGELES, a government entity, CITY OF LOS ANGELES ACTING BY AND THROUGH THE LOS ANGELES DEPARTMENT OF WATER AND POWER, a government entity, CALIFORNIA NATURAL RESOURCES AGENCY, a government entity, CALIFORNIA STATE PARKS, a government entity; SANTA MONICA MOUNTAINS CONSERVANCY, a government entity, and MOUNTAINS RECREATION & CONSERVATION AUTHORITY, a government entity, and DOES 1 through 100)

140. Plaintiffs incorporate by reference the allegations contained in the paragraphs above, and each and every part thereof with the same force and effect as though fully set forth herein.

141. Defendants owed Plaintiffs and other class members a duty to properly design, inspect, maintain, repair, and operate their water supply infrastructure and electrical power equipment in a reasonably safe manner, and to maintain and manage lands under their control, to prevent the ignition and spread of wildfires, especially under foreseeable extreme fire weather conditions

142. Defendants further owed a duty to Plaintiffs and other class members to take reasonable steps to avoid the risk of fire damage, including but not limited to ensuring adequate water availability and pressure to fight fires, maintaining reservoir infrastructure in a functional

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state, inspecting and repairing wooden utility poles and overhead power lines, and taking appropriate steps to de-energize power lines, maintaining and managing fire-prone lands and vegetation, in light of known fire risk.

143. Defendants breached their duty of care by:

a. Failing to timely repair or restore the Santa Ynez Reservoir and Palisades Reservoir, knowingly leaving them empty and/or inoperable before the fire despite the known wildfire risk to the Pacific Palisades region;

b. Allowing backup water tanks to be rapidly depleted within hours of the fire igniting, resulting in insufficient water pressure for firefighting;

c. Designing and maintaining a water system with inadequate pressure and redundancy, which Defendants knew or should have known could not sustain fire suppression efforts in an urban-wildfire.

d. Failing to properly maintain electrical infrastructure which caused additional fires to be ignored;

e. Failing to de-energize power lines despite extreme fire danger warnings forecasting high wind events, in violation of industry best practices;

f. Continuing to transmit power through vulnerable distribution systems during a red flag event, resulting in pole fires, transformer explosions, and arcing that ignited or exacerbated spot fires throughout the impacted area.

g. Failing to conduct adequate vegetation management.

h. Failing to replace, modernize, maintain, manage, inspect, monitor, operate, and design water, electrical, and land management infrastructure.

144. As a direct and proximate result of Defendants' breaches, the Palisades Fire ignited, spread, and caused mass destruction and suffering to Plaintiffs, other class members, and their communities, entitling them to damages, according to proof.

145. Defendants had actual or constructive notice of the dangerous conditions created by their conduct and failed to take adequate preventative or remedial measures, despite repeated and publicly available data highlighting the grave risk of fire.

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<u>FIFTH CAUSE OF ACTION</u>

Declaratory Relief

(Against Defendants CITY OF LOS ANGELES, a government entity, CITY OF LOS ANGELES ACTING BY AND THROUGH THE LOS ANGELES DEPARTMENT OF WATER AND POWER, a government entity, CALIFORNIA NATURAL RESOURCES AGENCY, a government entity, CALIFORNIA STATE PARKS, a government entity; SANTA MONICA MOUNTAINS CONSERVANCY, a government entity, and MOUNTAINS RECREATION & CONSERVATION AUTHORITY, a government entity, and DOES 1 through 100)

146. Plaintiffs incorporate by reference the allegations contained in the paragraphs above, and each and every part thereof with the same force and effect as though fully set forth herein.

147. Under California Government Code §§ 905 and 911.2, before initiating a lawsuit for money damages for death or for injury to person or to personal property against a public entity, a plaintiff is to present a written claim to the public entity within six (6) months of the accrual of the cause of action unless excused as futile, and before initiating a lawsuit for money damages relating to any other cause of action (i.e., not for death or for injury to person or to personal property) against a public entity, a plaintiff is to present a written claim to the public entity within one (1) year of the accrual of the cause of action unless excused as futile.

148. The 6-month requirement applies to claims for negligence, property damage, and other forms of tort liability.

149. The Palisades Fire occurred on or about January 7, 2025, however it raged on for several days and weeks thereafter. Absent a determination of tolling or futility, the six-month deadline for affected class members to present claims to Defendants may expire on or around July 7, 2025, and the twelve-month deadline for affected class members to present claims to Defendants may expire on or around January 7, 2026.

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150. Plaintiffs bring this action on behalf of themselves and a proposed class of individuals who suffered harm due to the Palisades Fire, as defined above. Plaintiffs seek a judicial declaration that the filing and pendency of this class action and/or presentment of a written claim to Defendants on behalf of Plaintiffs and the class satisfies the written claims requirement on behalf of Plaintiffs and the proposed class and constitutes substantial compliance with the procedural requirements of the California Tort Claims Act (also known as the California Government Claims Act).

151. An actual, present, and justiciable controversy has arisen between Plaintiffs, other class members, and Defendants as to whether filing this class action complaint and/or presentment of a written claim to Defendants on behalf of Plaintiffs and class members constitutes sufficient and timely compliance with California Government Code § 910, *et seq.* for purposes of preserving the claims of absent class members.

152. Plaintiffs contend and believe that Defendants will deny that filing this lawsuit and class complaint constitutes substantial compliance with the California Tort Claims Act on behalf of the class such that their legal rights and causes of action may be preserved and pursued after the six-month and twelve-month claims deadlines and/or that the submission of such claims is futile.

153. A declaratory judgment is necessary and proper so that Plaintiffs and the other class members may obtain clarity and assurance that their claims are not forfeited, barred, or time-limited due to procedural technicalities that could otherwise defeat meritorious actions against public entities. Without such a declaration, Plaintiffs and other class members face uncertainty as to their legal rights and ability to pursue just compensation for their losses.

154. Plaintiffs seek a judicial declaration that this Complaint and/or presentment of a written claim to Defendants on behalf Plaintiffs and the class:

a. Constitutes a written claim within the meaning of California Government Code § 910, *et seq*. for Plaintiffs and all class members,

b. Preserves and tolls the statute of limitations on their claims pending adjudication of the merits, and/or

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c. Complies with the substantive and procedural requirements of California law governing claims presentation to public entities.

DEMAND FOR JURY TRIAL

Plaintiffs, individually, and on behalf of other members of the general public similarly situated, request a trial by jury.

PRAYER FOR RELIEF

WHEREFORE, Plaintiffs, individually, and on behalf of other members of the general public similarly situated, pray for relief and judgment against Defendants, jointly and severally, as follows:

1. For an order certifying this action to proceed as a class action under California Code of Civil Procedure § 382, appointing Plaintiffs as the representatives of the class, appointing counsel for Plaintiffs as counsel for the class, and requiring Defendants provide to class counsel (a) immediately, the names and most current/last known contact information (address, e-mail, and telephone numbers) of all putative class members contained within records accessible to them and (b) after class certification, the names and most current/last known contact information (address, e-mail, and telephone numbers) of all members of the certified class contained within records accessible to them.

2. For all damages, including and not limited to, for costs of repair, depreciation, and/or replacement of damaged, destroyed, and/or lost real property, personal property, and/or business property, for loss of use, benefit, goodwill, and enjoyment of real property, personal property, and/or business property, and/or alternative living expenses, and for loss of wages, earning capacity, and/or business profits or proceeds and/or any related displacement expenses;

3. For a judicial declaration that filing this class action Complaint and/or presentment of a written claim to Defendants on behalf of all such persons constitutes substantial compliance with the claim presentation requirements under California Government Code § 910, *et seq.* on behalf of Plaintiffs and all class members, and that such claims are thus preserved and not barred by operation of the California Tort Claims Act.

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4. For attorney's fees, expert fees, consultant fees, and litigation costs and expense, to the extent allowed under California Code of Civil Procedure § 1021.9 and California Code of Civil Procedure § 1036;

5. For treble or double damages for wrongful injuries to timber, trees, or underwood on their property, as allowed under California Civil Code section 3346;

6. For appropriate injunctive relief;

7. For appropriate equitable relief;

8. For punitive or exemplary damages;

9. For all costs of suit;

10. For pre-judgment and post-judgment interest;

11. For general damages; and

12. For such other and further relief as the Court shall deem proper, all according to proof.

Dated: July 7, 2025

LAWYERS *for* JUSTICE, PC

By: ______________________________
Joanna Ghosh
Attorneys for Plaintiffs

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EXHIBIT A

RESEARCH PAPER
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International Association of Wildland Fire

Climate and weather drivers in southern California Santa Ana Wind and non-Santa Wind fires

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ABSTRACT

Background. Autumn and winter Santa Ana Winds (SAW) are responsible for the largest and most destructive wildfires in southern California. **Aims.** (1) To contrast fires ignited on SAW days vs non-SAW days, (2) evaluate the predictive ability of the Canadian Fire Weather Index (CFWI) for these two fire types, and (3) determine climate and weather factors responsible for the largest wildfires. **Methods.** CAL FIRE (California Department of Forestry and Fire Protection) FRAP (Fire and Resource Assessment Program) fire data were coupled with hourly climate data from four stations, and with regional indices of SAW wind speed, and with seasonal drought data from the Palmer Drought Severity Index. **Key results.** Fires on non-SAW days were more numerous and burned more area, and were substantial from May to October. CFWI indices were tied to fire occurrence and size for both non-SAW and SAW days, and in the days following ignition. Multiple regression models for months with the greatest area burned explained up to a quarter of variation in area burned. **Conclusions.** The drivers of fire size differ between non-SAW and SAW fires. The best predictor of fire size for non-SAW fires was drought during the prior 5 years, followed by a current year vapour pressure deficit. For SAW fires, wind speed followed by drought were most important.

Keywords: aiutumn fires, Canadian Fire Weather Index, drought, summer fires, vapour pressure deficit, VPD, wind speed.

Introduction

Wildfires have greatly increased in size and frequency in recent decades throughout the western USA due to a combination of global changes including population growth, fire management practices and climate change (Abatzoglou and Williams 2016; Syphard *et al.* 2017; Liang and Hurteau 2023; MacDonald *et al.* 2023). Within regions such as California, the factors driving increased fire activity vary geographically (Keeley and Syphard 2017) and are often tied to patterns of ignitions (Peterson *et al.* 2011; Faivre *et al.* 2014; Syphard and Keeley 2015). Climate largely influences fire activity through its influence on biomass production and fuel aridity (Bradstock 2010; Jolly *et al.* 2015). There is evidence that global warming is exacerbating fire regimes leading to larger wildfires (Williams *et al.* 2019). However, anticipating future fire activity is complicated by the complexity and interactions between weather, vegetation, and people (Flannigan *et al.* 2009).

Understanding the future trajectory of fires is of extreme importance, but modelling studies yield varying indications regarding the extent and location of changes in future fire patterns. Findings indicate that the number and size of wildfires throughout the western USA are linked to the climate with variations in moisture availability being the key (Abatzoglou and Kolden 2013), and often reflected in patterns of vapour pressure deficit (VPD) (Williams *et al.* 2015). However, the predictors of large fires vary regionally (Stavros *et al.* 2014), and Brey *et al.* (2020) found that for the western USA summer fires, other climate and weather parameters were more useful than VPD.

Complicating our understanding of the role of how climate and weather impact fire behaviour is the observation that antecedent weather a week or more before the date of ignition, as well as weather conditions for a week or more afterward, are linked to many large fire events (Abatzoglou and Kolden 2011; Barbero *et al.* 2014; Stavros *et al.* 2014). One study for large fires across the western USA found that conditions on the day of ignition were correlated with peak fire daily growth but not final size or duration (Potter 2018*b*). Climate and weather before (Cayan *et al.* 2022) and after ignition in particular are often critical in determining the rate of growth and ultimately fire size (Potter 2023).

Both climate changes and localised weather conditions play a role in determining fire occurrence and behaviour, and indices for predicting fires have been an important means of preparing for fire events since the early part of the 20th century (Hardy and Hardy 2007). Numerous fire danger indices have been developed with varying success. This is likely due to the considerable regional variation exhibited by drivers of fire activity (Mees and Chase 1991; Stavros *et al.* 2014). For example, in southern California it was found that simple weather parameters such as temperature, relative humidity and wind alone were better predictors of fire size than more complex burn indices (Schoenberg *et al.* 2007; Madadgar *et al.* 2020). Furthermore, linear models demonstrate that autumn precipitation is significantly tied to the number of autumn fires, but the prior year spring precipitation is a better predictor of area burned (Keeley 2004). Taking an alternative lumped approach, it has been shown that the timing and amount of autumn precipitation plays a critical role in area burned by large ($>$100 ha) autumn and early winter fires, with 89% of the area burned occurring from fires that started before the onset of significant precipitation (Cayan *et al.* 2022).

Another fire risk metric is the Haines Index that has been widely utilised, but has a number of limitations including the large spatial variation in this index across regions (Winkler *et al.* 2007) and some consider it to be of limited value (Lu *et al.* 2011; Potter 2018*a*). The Canadian Fire Weather Index (CFWI) has proven useful for predicting North American boreal forest fires (Stocks *et al.* 1989; Waddington *et al.* 2012) as well as fires on other northern hemisphere continents (e.g. Viegas *et al.* 1999; Dimitrakopoulos *et al.* 2011; Tian *et al.* 2011). CFWI uses hourly measures of temperature, precipitation, relative humidity and wind speed to produce several metrics of daily conditions assumed to be associated with extreme fire behaviour. One of these metrics is the Fire Weather Index (FWI), which, when coupled with fuel type, is a quantitative measure of expected fire intensity and is widely used as a general index of fire danger. Another commonly used metric is the Fine Fuel Moisture Code (FFMC) that is a rating of the moisture content of litter and other fine fuels, indicating the relative ease of ignition and flammability of fine fuels, with increasing fire danger as FFMC increases.

In southern California the most damaging fires are those that occur during autumn and winter Santa Ana Wind (SAW) events, although most non-SAW fires occur at other times of the year (Jin *et al.* 2015; Syphard *et al.* 2021). SAWs are foehn-type winds that are annual events in southern California, and similar winds are associated with extreme fires in north coastal California (Nauslar *et al.* 2018) and in Oregon (Abatzoglou *et al.* 2021). Recent climate model projections suggest that SAW activity may diminish somewhat in future decades (Pierce *et al.* 2018; Guzman-Morales and Gershunov 2019), but these event-specific effects may be counteracted by warming effects and generally drier autumn climate that could increase SAW fires, based on the CFWI (Goss *et al.* 2020). Further complicating the understanding of how SAW winds impact fires is the observation that different synoptic weather conditions can result in hot SAWs or cold SAWs (Gershunov *et al.* 2021), and evidence of increasing frequency of conditions conducive to hazardous fires during winter months (Guirguis *et al.* 2023), both of which have the potential for affecting wildfire activity. However, these climatic influences are best evaluated alongside other over-riding factors such as ignition sources (Keeley *et al.* 2021), and thus there is need for a more thorough understanding of the reliability of this index for predicting fire events in southern California for both SAW and non-SAW fires. It seems likely they differ given that these two types of fires occur at different times of the year.

This study examines the value of these indices in predicting fire outcomes for both Santa Ana Wind (SAW) driven fires (defined as a fire that ignited on the day of a SAW event) and fires that occur on other days (non-SAW). In addition, we examine the independent effect of relative humidity, mean daily wind speed, and the vapour pressure deficit (VPD), plus antecedent seasonal and annual drought events with data from the Palmer Drought Severity Index (PDSI) (Dai 2011). For Santa Ana Wind days we investigated the fire activity relative to the SAW Regional Index (SAWRI), a metric for the regional mean wind speed during periods of consistent northeasterly winds (Guzman-Morales *et al.* 2016).

Methods

Our focus was on the southern California region defined by Guzman-Morales *et al.* (2016) in generating the SAW Regional index. We utilised weather station data for four stations in four southern California counties (Fig. 1) that had a long history of hourly climate data (Desert Research Institute; https://wrcc.dri.edu/Projects/data.php). The two stations with the longest record (1950–2020), were San Diego International Airport in San Diego County and Los Angeles International Airport in Los Angeles County. Two other stations with a more limited records (1998–2020) were selected specifically because they are more interior

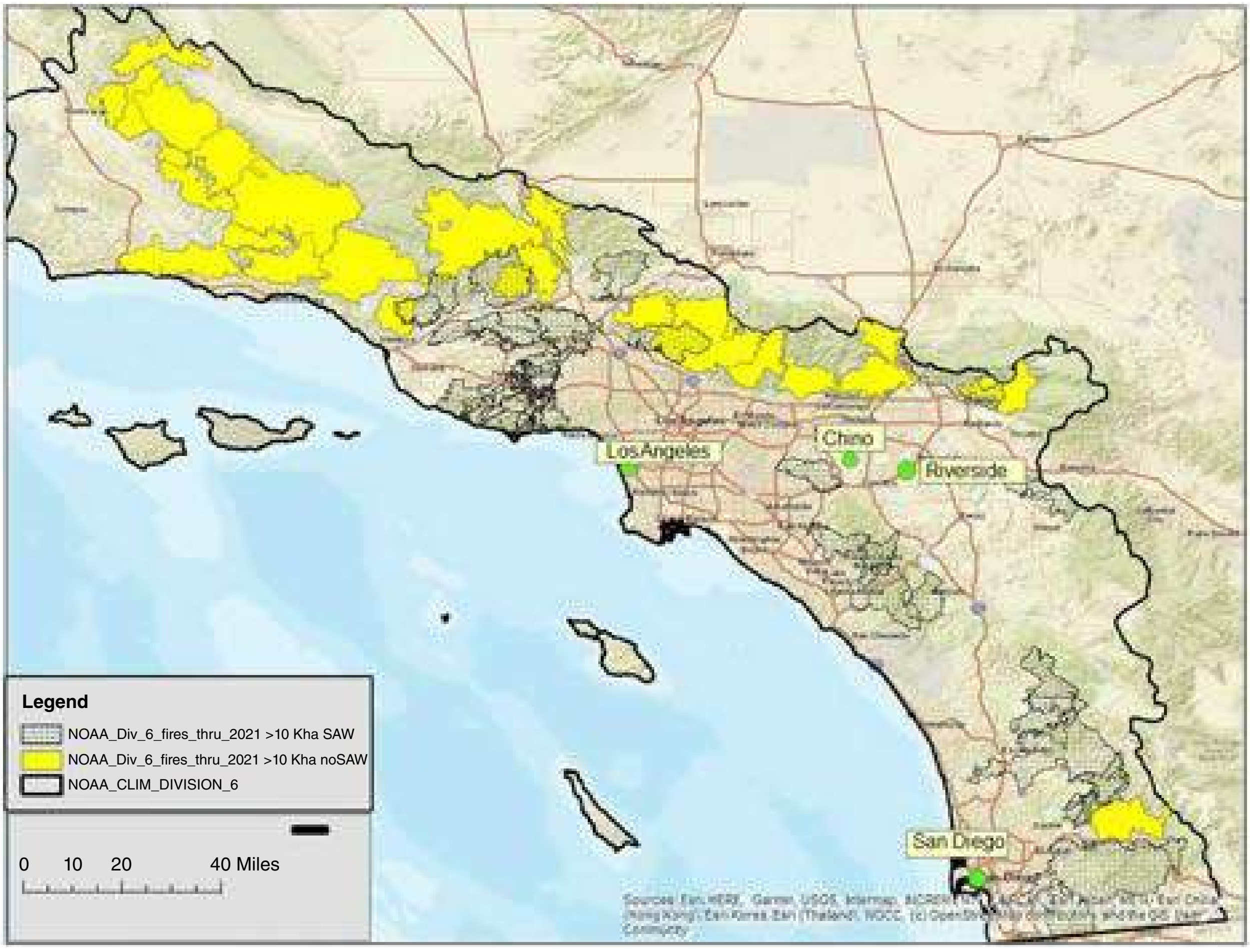

Fig. 1. South coast region in this study and the four climate stations distributed across four counties, and perimeters for fires over 10,000 ha; yellow for non-SAW fires and dots for SAW fires. National Oceanographic and Atmospheric Administration California Division 6.

sites; they were the Riverside Municipal Airport in Riverside County and the Chino Airport in San Bernardino County. All of these stations are potentially affected by Santa Ana Wind (SAW) corridors - from north to south: Newhall Pass, Cajon Pass, Banning Pass, and the Hwy 8 Corridor (Moritz *et al.* 2010; Rolinski *et al.* 2019).

Hourly data for temperature, precipitation, relative humidity, and wind speed were used in calculating the CFWI fire weather indices as described by Van Wagner (1987) using an R package outlined in Wang *et al.* (2017). The FWI is a numeric rating of fire intensity that is commonly used as a general index of fire danger; the FFMC is a numeric rating of the moisture content of fine fuels and is an indicator of ignition and flammability; and the Drought Code (DC), fuel moisture measure.

The Palmer Drought Severity Index (PDSI) for the NOAA Region 6, which is approximately comparable with the region Guzman-Morales *et al.* (2016) used to generate the SAW Regional Index (SAWRI) for, was obtained from the National Center for Atmospheric Research (NCAR) (https://climatedataguide.ucar.edu/climate-data/palmer-drought-severity-index-pdsi#, accessed 1 January 2023) for the years 1950–2020.

SAW days for 1950–2018 were from Guzman-Morales and Gershunov (2019), based on the daily downscaling of the National Center for Environmental Prediction/National Center for Atmospheric Research (NCEP/NCAR) Global Reanalysis 1. The SAW Regional Index (SAWRI) was calculated as the regional mean wind speed during periods of consistent northeasterly winds over the southern California region. These data were available through 2018. For the years 2019–2020, SAWRI was computed as the maximum windspeed for periods with consistent northeasterly winds, as described by Rolinski *et al.* (2019).

Fire history included ignitions from Santa Barbara to San Diego counties for the years 1950–2020 from the CAL FIRE FRAP fire history database (http://frap.fire.ca.gov/data/frapgisdata). This region is comparable to the NOAA South Coast Division 6, although not directly overlapping the SAWRI area as defined by Guzman-Morales and Gershunov (2019).

Atmospheric circulation patterns that characterise SAW days have imposed a much larger footprint that includes much of Division 6 (Cayan *et al.* 2022). FRAP is a spatially explicit database that provides day of ignition, final fire size and cause, and is relatively complete for this time period for fires >40 ha, though a number of additions and corrections were made as

Table 1. Area burned by non-SAW and SAW fires in the first half and second half of the 71 year record; mean fire size was compared with a two sample *t*-test.

	Non-SAW			SAW		
	1950–1984	1985–2020		1950–1984	1985–2020	
N	11,239	11,509		1540	1635	
Total area burned (ha)	803,470	1,299,600		593,800	867,900	
Mean fire size (ha)	71	112	P = 0.020	385	531	P = 0.451
Unknown ignitions (%)	48	12		45	4	
Lightning (%)	4	22		0	0	
Equipment use (%)	3	22		<1	24	
Debris burning (%)	6	46		25	1	
Arson (%)	6	18		14	18	
Powerline (%)	4	7		22	45	

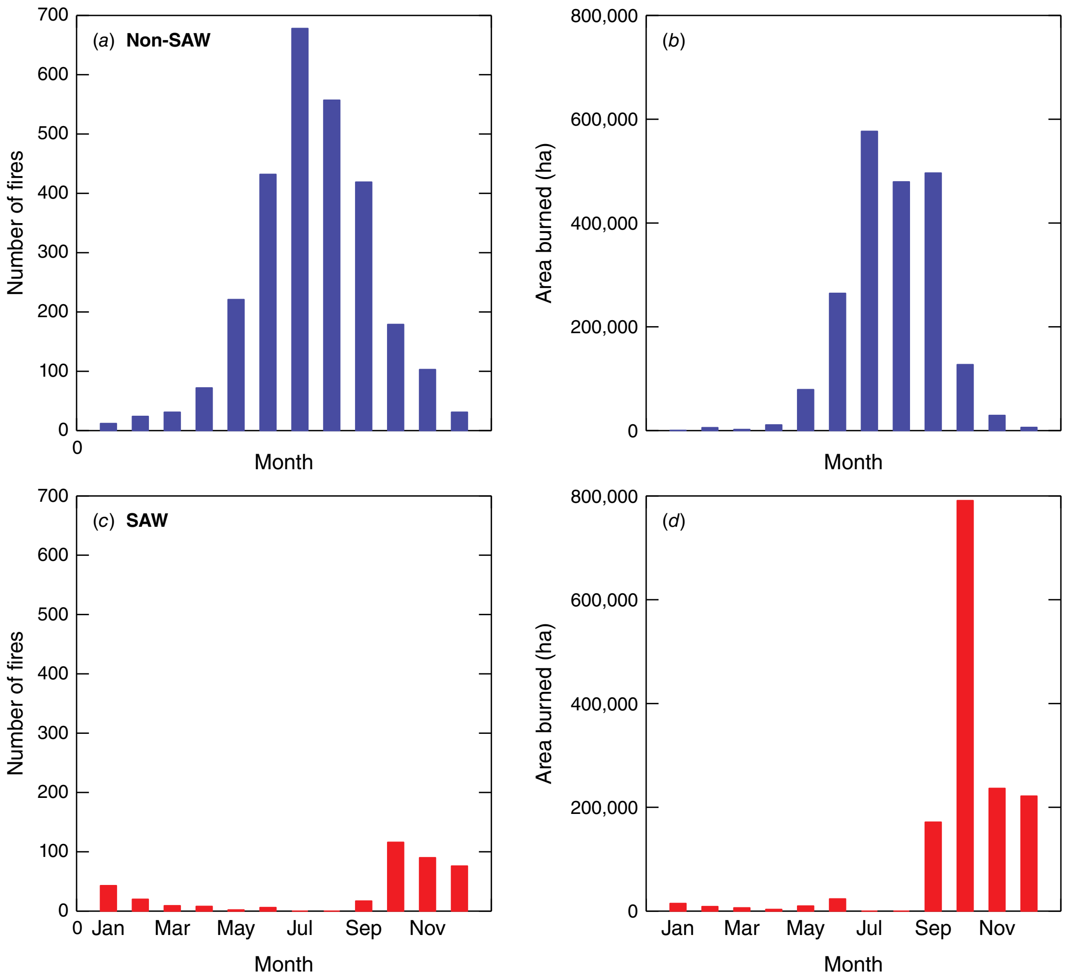

Fig. 2. Monthly distribution of (*a*, *c*) number of fires and (*b*, *d*) area burned for non-SAW and SAW fires in the South Coast region.

described in Keeley *et al.* (2021). Here we define SAW fires as those that ignited on a day with a SAWRI >1. This differs from the criterion used by Cayan *et al.* (2022) where a SAW day was defined as one that registered a SAWRI >0.5, and the day before and the day after registered SAWRI >0. Comparing these approaches showed that this definition included 2% more SAW fires and 5% more area burned by SAW fires. Although SAW fires and their area burned are defined by a SAW event on the date of ignition, many SAW fires continue burning for days after ignition and sometimes after the SAW event is over. Sorting out the proportion of area burned on SAW vs non-SAW days is not possible with the FRAP database. Even if one could, it would be complicated by the observation that SAW related characteristics such as extremely low relative humidity and high temperatures, due to the dry adiabatic warming, continue for days after the northeastern winds have subsided (Keeley *et al.* 2009).

Results

SAW vs non_SAW fires

Over the period from 1950 to 2020, there were 3219 Santa Ana Wind (SAW) days, and fires ignited on 12% of those days. Over this same period, there were 22,704 non-SAW days, and 12% of those days had ignitions. Total area burned from ignitions on SAW days was 1.461 million ha and on non-SAW days 2.103 million ha. Distribution of fires by size classes showed that the majority (62%) of fires smaller than 100 ha were during non-SAW days (Supplementary Table S1). Although there was an order of magnitude more fires ignited on non-SAW days, the majority (56%) of fires over 50,000 ha started on SAW days, and these included the three largest fires. The largest single ignition was the Thomas Fire ignited on 4 December 2017 that burned 114,082 ha; however, four fires ignited on the day of the 25 October 2003 SAW event burned a substantially greater area of 194,311 ha due to the Cedar (109,546 ha), Simi (43,533 ha), Old (37,000 ha), and Padua (4232 ha) fires.

These large fires occurred during the last couple of decades, although during the whole period of record from 1950 to 2020, there was a highly significant ($P < 0.001$) decline in mean and median fire size due to increasing numbers of smaller fires on both SAW and non-Saw days (Supplementary Fig. S1). Although there was a highly significant drop over time in fire size, variability within a year was huge and so variance in fire size was large, accounting for the very low r^2 ($r^2 = 0.08$ for both SAW and non-SAW). Comparing the first half of the record (1950–1984) with the second half (1985–2020) showed that the total area burned for both types of fires increased in the second half of the record and

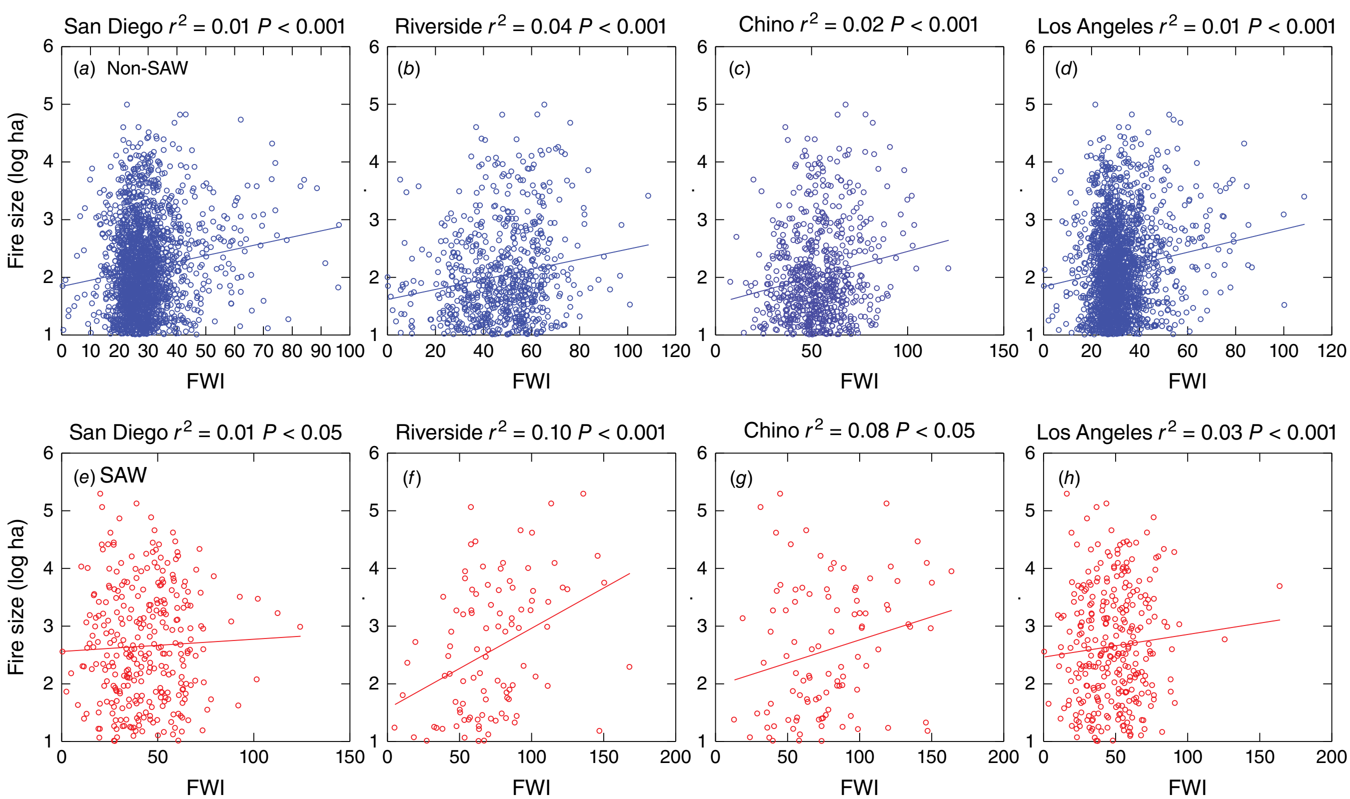

Fig. 3. Individual fires plotted by size for levels of FWI at the four climate stations; adjusted r^2 for bivariate regression of log ha and FWI. (*a–d*) Non-SAW fires in blue for the four climate stations, and (*e–h*) SAW in red for the four stations.

the mean fire size for non-SAW fires was significantly greater in the second half of the record (Table 1). Also, the ignition sources changed over the early vs late periods. During the last 35 years, there was a marked increase in the known cause of fires. In the past 36 years, a major cause of area burned by fires ignited on non-SAW days was lightning, however, this was not a cause of fires on SAW days. During the recent period for non-SAW and SAW fires, equipment use and arson were important ignition sources. Powerline failures accounted for the bulk of area burned on SAW days but was a minor cause on non-SAW days.

Non-SAW fires occurred in all months of the year, peaking in June through September, whereas SAW fires were rare in March through June, absent in July and August, but peaked in October through December (Fig. 2*a*, *c*). The bulk of the area burned by fires ignited on non-SAW days was during the months of June to September (Fig. 2*b*), whereas on SAW days it was September to December (Fig. 2*d*), with substantially greater area burned in October than other months. September was a month of substantial burning that occurred more or less equally on SAW and non-SAW days. In addition to being temporally separated, non-SAW and SAW fires tended to be somewhat different in their spatial distribution, with more area burned from large non-SAW fires in more interior areas than large SAW fires (Fig. 1).

Fire weather indices

Considering only those days when an ignition occurred, there was a highly significant relationship between the FWI and fire size for non-SAW days at all four climate stations (Fig. 3*a*–*d*); however, due to the extreme range in fire sizes in all years, the variance (r^2) explained by these models was low, i.e. the FWI had limited predictive value for fire size. For SAW days, there was also a significant relationship between FWI and fire size, and the r^2 value was slightly higher for the two interior stations (Fig. 3*f*, *g*).

The Fine Fuel Moisture Content (FFMC) for ignitions on non-SAW days was significantly related to fire size at all stations (Fig. 4*a*–*d*), but for SAW days, it was significant at only two stations (Fig. 4*e*–*h*). The Drought Code (DC) was significantly related to fire size ignited on non-SAW days at three stations, and slightly significant on SAW days at three stations (Fig. 5).

To examine these CFWI parameters at a finer temporal scale we investigated FWI, FFMC and DC by month for both non-SAW and SAW days at all four climate stations. First, using a two-sample *t*-test, we asked is there a significant difference in these two indices for days when no fire was initiated and those days when a fire was ignited (Supplementary Table S2). The pattern was similar across all four climate stations. FWI was significantly different on

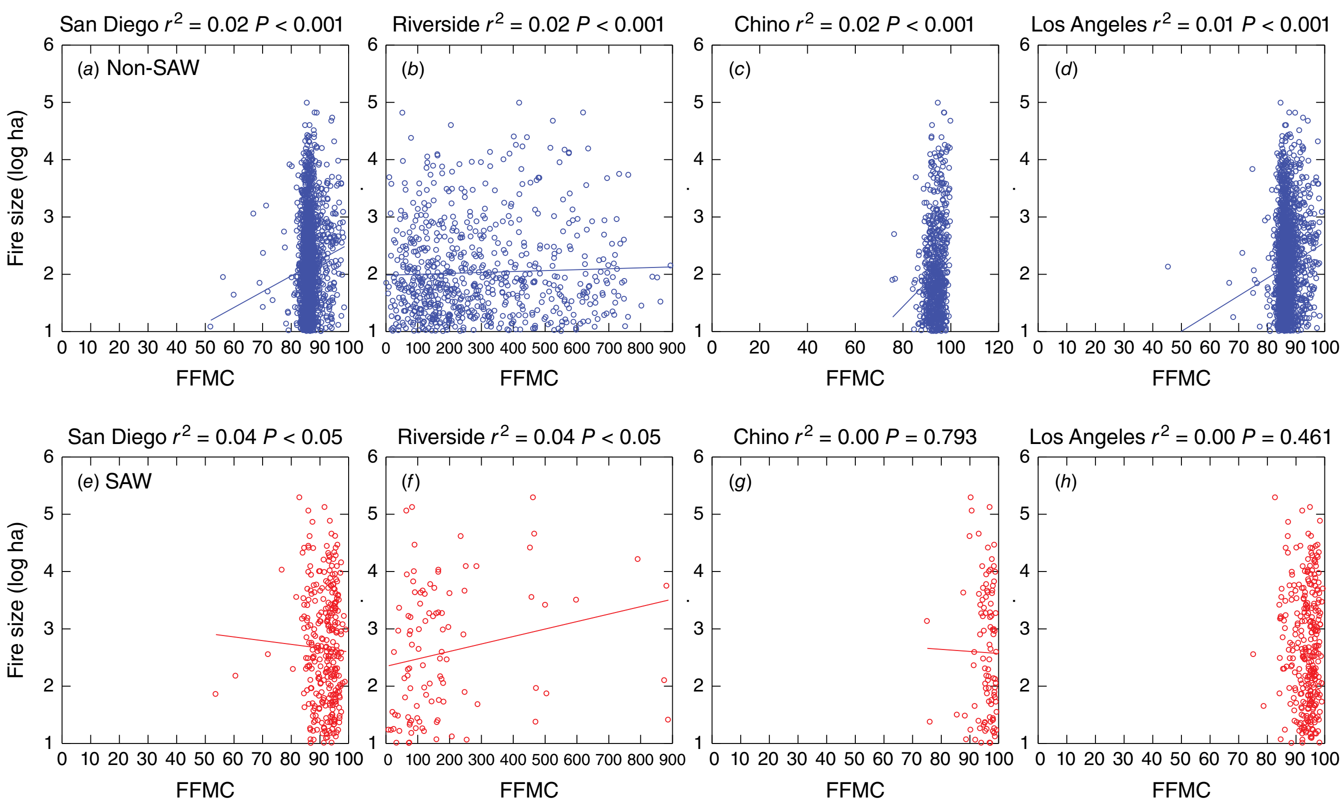

Fig. 4. Individual fires plotted by size for levels of FFMC at the four climate stations; adjusted r^2 for bivariate regression of log ha and FFMC. (*a*–*d*) Non-SAW in blue for the four stations, and (*e*–*h*) SAW in red for the four stations.

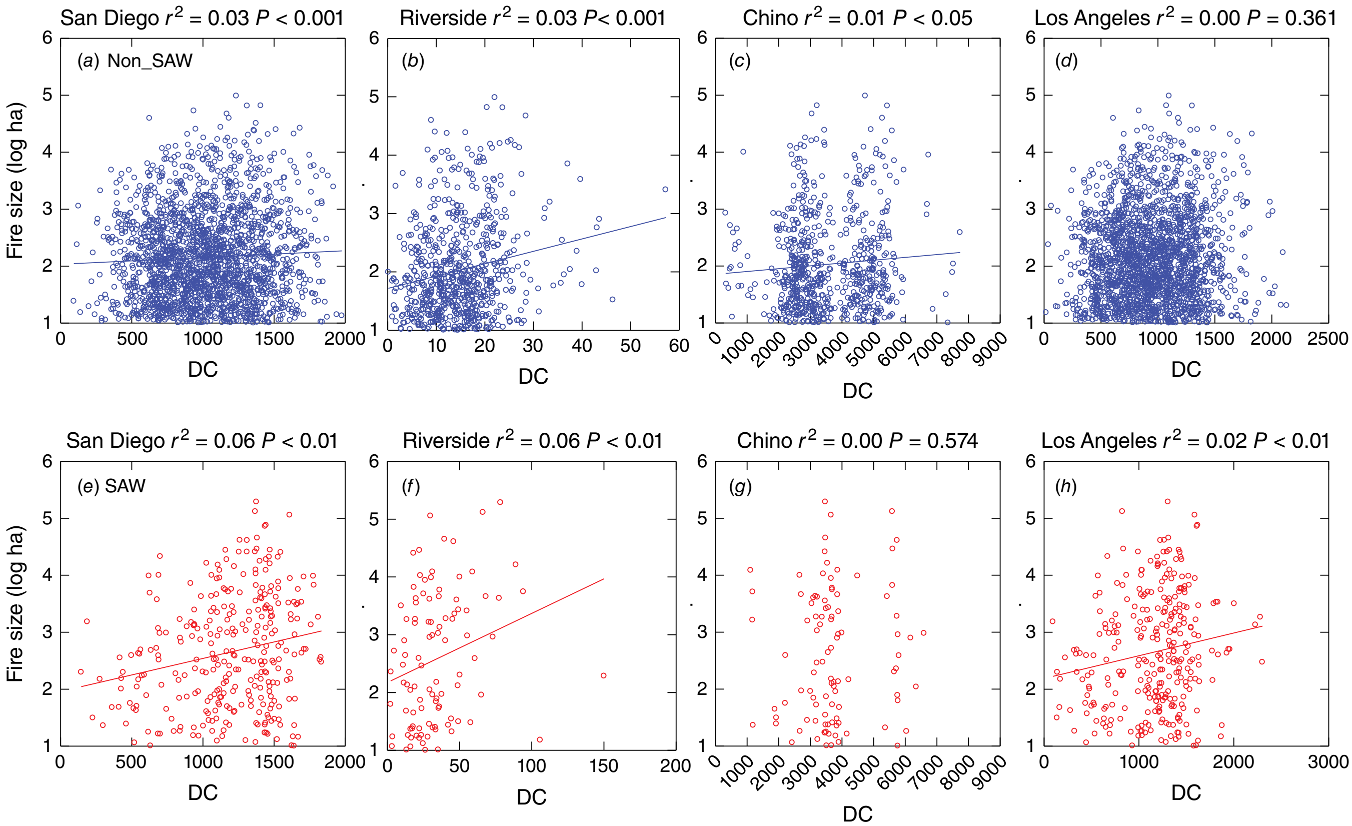

Fig. 5. Individual fires plotted by size for levels of DC at the four climate stations; adjusted r^2 for bivariate regression of log ha and DC. (*a–d*) Non-SAW in blue for the four stations, and (*e–h*) SAW in red for the four stations.

days with a fire in all months for non-SAW fires, and for the months October–February for SAW fires. The FFMC was also significantly different on days with fire relative to non-fire days, however, during the months of greatest area burned for non-SAW (June–September) and SAW (October–December) fires, the difference was only around 1–2%. The DC showed some significant differences between fire and non-fire days but not in most of the months when the greatest area was burned.

We then asked the question does the FWI, FFMC or DC provide a clue as to whether fires will be large (>10,000 ha) or small (<1000 ha), and using a two-sample *t*-test, the answer was no. For all four climate stations for the months with the highest area burned there was no significant difference in the FWI, FFMC and DC between large and small fires as defined here (data not shown).

When we focused on megafires (>25,000 ha) relative to much smaller fires (100–999 ha) for the two long term data sets at Los Angeles and San Diego (Table 2), these indices did illustrate some useful associations. As part of our analysis, we investigated these indices on the day of ignition, and the average for the week prior to ignition, and the week after ignition. For non-SAW days these indices did not provide much of an indicator of megafires. However, as shown in Table 2, for SAW days there were many indicators using the index on the day of ignition, the week before and the week after.

Other climate and weather factors

Climate and weather parameters beyond the CFWI metrics were compared using a two sample *t*-test between days without and with fire for both non-SAW and SAW days (Table 3). For non-SAW days there was generally a highly significant difference in temperature. This was not always the case with SAW days. Daily average windspeed was generally not significantly different on days when fires ignited on both non-SAW and SAW days.

It is generally considered that one of the strongest drivers of fire activity in the western USA is the vapour pressure deficit (VPD), and this was significantly related to fire size on non-SAW days but not on SAW days (Fig. 6). However, on a monthly basis, VPD was significantly higher on days when fires ignited vs days with no fire for non-SAW in nearly all months; for SAW days, this was significant for both winter and autumn months (Table 3).

We addressed the question of whether average temperature, VPD and average wind speed differed on days when fire ignitions resulted in megafires (>25,000 ha) vs much smaller fires (100–999 ha) for the two long term data sets at

Table 2. *t*-tests for difference between megafires (>25,000 ha) and small fires (100–999 ha) on a day of ignition and the prior 5 days (-week) and the following 5 days (+week) for the two sites with long term records (1950–2020); for FWI, FFMC, and DC. Only months with sufficient number of large fires presented; (0) is the day of ignition, (1,2,3,4,5) is a day or days before or after the day of ignition, (wk) is average of day of ignition and prior 5 days or following 5 days; NS = $P > 0.05$, * = $P < 0.05$, ** = $P < 0.01$, *** = $P < 0.001$.

	FWI		FFMC		DC	
	-Week	+Week	-Week	+Week	-Week	+Week
San Diego						
Month	Non-SAW		Non-SAW		Non-SAW	
7	NS	NS	NS	NS	NS	NS
8	NS	5*	NS	5*	NS	NS
9	NS	NS	NS	NS	NS	NS
	SAW		SAW		SAW	
9	NS	NS	NS	NS	NS	NS
10	NS	NS	NS	NS	1*2*3*5*wk*	2*3*4*wk*
11	0***	0***5*	0***1***5***	0***1***5***	NS	NS
12	1**5*	NS	1**	1**	NS	NS
Los Angeles						
Month	Non-SAW		Non-SAW		Non-SAW	
7	NS	NS	NS	NS	NS	NS
8	NS	NS	NS	NS	NS	NS
9	NS	NS	NS	NS	NS	NS
	SAW		SAW		SAW	
9	NS	1*2*3*wk*	NS	1*2*wk*	0*1*2*3*4*5*wk*	0*1*2*3*4*5*wk*
10	1***2*wk**	NS	NS	NS	0*1*2*3*4*5*wk*	0*1*2*3*4*5*wk*
11	1**	2***4**5 wk**	1***	2*3*4**5***wk*	NS	NS
12	1*	1**2**3***wk**	NS	1*2*3***wk*	NS	NS

San Diego and Los Angeles (Table 4). We investigated these indices for the day of ignition, the average for the week prior to ignition, and the week after ignition. The more southerly station, San Diego, showed no significant differences in temperature for the day of ignition or the week before or after for both non-SAW and SAW days. However, for Los Angeles for non-SAW days there was a highly significant difference for temperature the week prior to fires in July and the week after in September. On SAW days the only significant effect of temperature was in the week following ignition.

In the week prior to ignition, average wind speed did show a significant effect on fires ignited on non-SAW days. but no such effect was found for fires ignited on SAW days. However, during the week following ignitions occurring on SAW days, average wind speed was significantly higher than the control group. Unlike this average wind speed from the four stations data, the SAWRI (the regional mean wind speed during periods of consistent northeasterly winds), was strongly tied to the fire size in some months, as determined by using *t*-tests comparing megafires (>25,000 ha) vs small fires (<1000 ha) (data not shown, but summarised here). For October (the month with the greatest area burned) (Fig. 2), there was a significant difference ($P < 0.05$) of the average SAWRI between small vs megafires for the week prior to ignition, a highly significant difference ($P < 0.001$) of the SAWRI on the day of ignition, and significant differences of SAWRI on the day after ignition ($P < 0.05$), and average over the week after ($P < 0.01$). For November and December the average of this index for the week after ignition was also significantly higher ($P < 0.05$) for megafires than small fires.

Annually, there are many SAW events without a fire ignition. Throughout the period 1950–2020, the probability of a fire during a SAW event (i.e. the number of SAW fires/SAW events) increased during this period with a $P < 0.050$ ($r^2 = 0.051$). Thus, there was a significant trend in increasing likelihood of a fire during a SAW event, though the annual variability was huge, resulting in a rather low r^2.

Vapour pressure deficit (VPD), which was significantly related to fire size (Fig. 6) on non-SAW days, showed only a slightly significant effect on megafires for the month of September (Table 4). Ironically, for SAW days when there

Table 3. *t*-test between days without fire and those with fire by month on non-SAW days and SAW days for mean temperature, average wind speed and vapour pressure deficit; NS = $P > 0.05$, * = $P < 0.05$, ** = $P < 0.01$, *** = $P < 0.001$.

	Temperature						Wind speed						VPD					
	Non-SAW			SAW			Non-SAW			SAW			Non-SAW			SAW		
Month	No-fire	Fire		No-fire	Fire		No-fire	Fire		No-fire	Fire		No-fire	Fire		No-fire	Fire	
San Diego																		
1	16.5	18.7	*	18.7	20.7	**			NS			NS	0.9	1.3	*	1.4	1.8	**
2	16.9	18.9	*	19.6	21.6	*			NS	14.0	15.8	*	0.8	1.2	*	2.0	1.5	*
3	17.5	20.5	***	20.4	24.2	**			NS			NS	0.9	1.4	***	1.5	2.4	*
4	18.5	21.5	***			NS			NS			NS	0.9	1.5	***			NS
5	19.2	20.8	***			NS			NS			NS	0.9	1.1	***			NS
6	20.4	21.8	***	.	.	.			NS	.	.	.	0.8	1.0	***	.	.	.
7	22.7	23.5	***	.	.	.	16.5	17	**	.	.	.	0.9	1.0	***	.	.	.
8	23.7	24.4	***	.	.	.			NS	.	.	.	1.0	1.1	***	.	.	.
9	23.3	25.0	***			NS			NS			NS	1.1	1.3	***			NS
10	21.8	23.8	***	23.7	25.4	***			NS			NS	1.1	1.5	***	1.8	2.3	***
11	19.4	21.6	***	21.2	23.8	***			NS			NS	1.0	1.5	***	1.7	2.3	***
12	17.0	19.1	***	18.4	21.2	***			NS			NS	0.9	1.3	**	1.3	2.0	***
Riverside																		
1			NS			NS			NS	13.7	22.3	**			NS	1.9	2.3	**
2	16.6	20.8	**			NS			NS			NS	1.1	1.9	**			NS
3	19.3	22.9	***	22.6	26.9	*			NS			NS	1.4	2.0	**	2.3	3.2	*
4	21.5	25.9	***			NS			NS			NS	1.7	2.7	***			NS
5	23.5	27.2	***			NS	11.8	13.1	*			NS	1.8	2.7	***			NS
6	27.1	29.6	***	.	.	.	11.9	12.8	*	.	.	.	2.3	2.8	***	.	.	.
7	31.1	32.8	***	.	.	.			NS	.	.	.	3	3.5	***	.	.	.
8	31.9	33.4	***	.	.	.			NS	.	.	.	3.3	3.7	***	.	.	.
9	29.9	32.2	***			NS			NS			NS	3.1	3.6	***			NS
10	25.3	28.1	***			NS	9.0	11.4	**	12.4	18.4	**	2.3	3.0	***	3.1	3.6	*
11	20.8	24.7	***	22.8	25.9	**			NS			NS	1.7	2.5	***	2.3	3	**

(*Continued on next page*)

Table 3. (*Continued*)

	Temperature						Wind speed						VPD					
	Non-SAW			SAW			Non-SAW			SAW			Non-SAW			SAW		
Month	No-fire	Fire		No-fire	Fire		No-fire	Fire		No-fire	Fire		No-fire	Fire		No-fire	Fire	
12	16.5	19.5	*	18.8	20.3	*			NS	14.5	19.9	*	1.1	1.7	*	1.8	2	*
Chino																		
1			NS	20.2	22.5	*			NS			NS			NS	1.8	2.3	**
2	17.0	21.1	**	21.4	24.3	*	10.6	14.3	*			NS	1.1	1.8	**	2.1	2.7	*
3	19.6	23.3	**	23.1	27.3	*			NS			NS	1.4	2.0	**			NS
4	22.0	26.9	***			NS			NS			NS	1.7	2.9	***			NS
5	24.3	27.9	***			NS			NS			NS	1.9	2.7	***			NS
6	27.6	30.1	***	.	.	.			NS	.	.	.	2.3	3.0	***	.	.	.
7	31.6	33.6	***	.	.	.	14.2	15	*	.	.	.	3.0	3.6	***	.	.	.
8	32.7	34.1	***	.	.	.			NS	.	.	.	3.4	3.8	***	.	.	.
9	30.7	33.3	***			NS			NS			NS	3.1	3.9	***			NS
10	26.1	29.1	***			NS			NS	13.9	19.3	**	2.3	3.2	***			NS
11	21.3	25.2	***	23.3	27.2	**			NS			NS	1.7	2.5	***	2.3	3.2	***
12	16.9	20.5	***	19	21.6	***			NS	13.6	19.3	*	1.1	1.8	**	1.7	2.2	***
Los Angeles																		
1	16.0	19.4	*	19.3	21.8	***	11.9	12.6	NS	10.2	11.6	NS	0.8	1.6	**	1.6	2.1	***
2	16.4	19.1	**	20.2	22.9	**	14.7	13.7	NS	12.4	10.8	NS	0.8	1.3	**	1.6	2.2	***
3	17.1	19.8	***	20.9	23.8	*	17.8	16.1	*	15.3	20.9	NS	0.8	1.3	**	1.7	2.3	NS
4	18.3	21.2	***	23.4	27.6	NS	19.7	20.3	NS	19.7	17.7	NS	0.9	1.4	***	2.1	3.0	NS
5	19.4	21.1	***	27.1	25.8	NS	19.4	19.5	NS	.		.	0.9	1.2	***	2.0	2.4	NS
6	20.7	21.9	***	.	.	.	18.4	18.8	NS	.	.	.	0.9	1.1	***	.	.	.
7	22.9	23.4	***	.	.	.	18.1	18.6	**	.	.	.	1.1	1.2	***	.	.	.
8	23.5	24.0	***	.	.	.	18.3	18.3	NS	.	.	.	1.1	1.3	***	.	.	.
9	23.0	24.5	***	26.9	29.5	NS	17.6	17.7	NS	18.7	17.3	NS	1.1	1.5	***	2.7	3.3	NS
10	21.6	23.7	***	24.9	27.1	***	16.4	16.7	NS	15.4	13.9	*	1.1	1.7	***	2.2	3.0	***
11	19.3	21.8	***	22.2	25.1	***	13.9	13.9	NS	11.2	11.6	NS	1.1	1.7	***	2.0	2.7	***
12	16.7	19.6	***	18.9	21.7	***	11.9	11.9	NS	10.7	11.6	NS	0.9	1.5	**	1.5	2.1	***

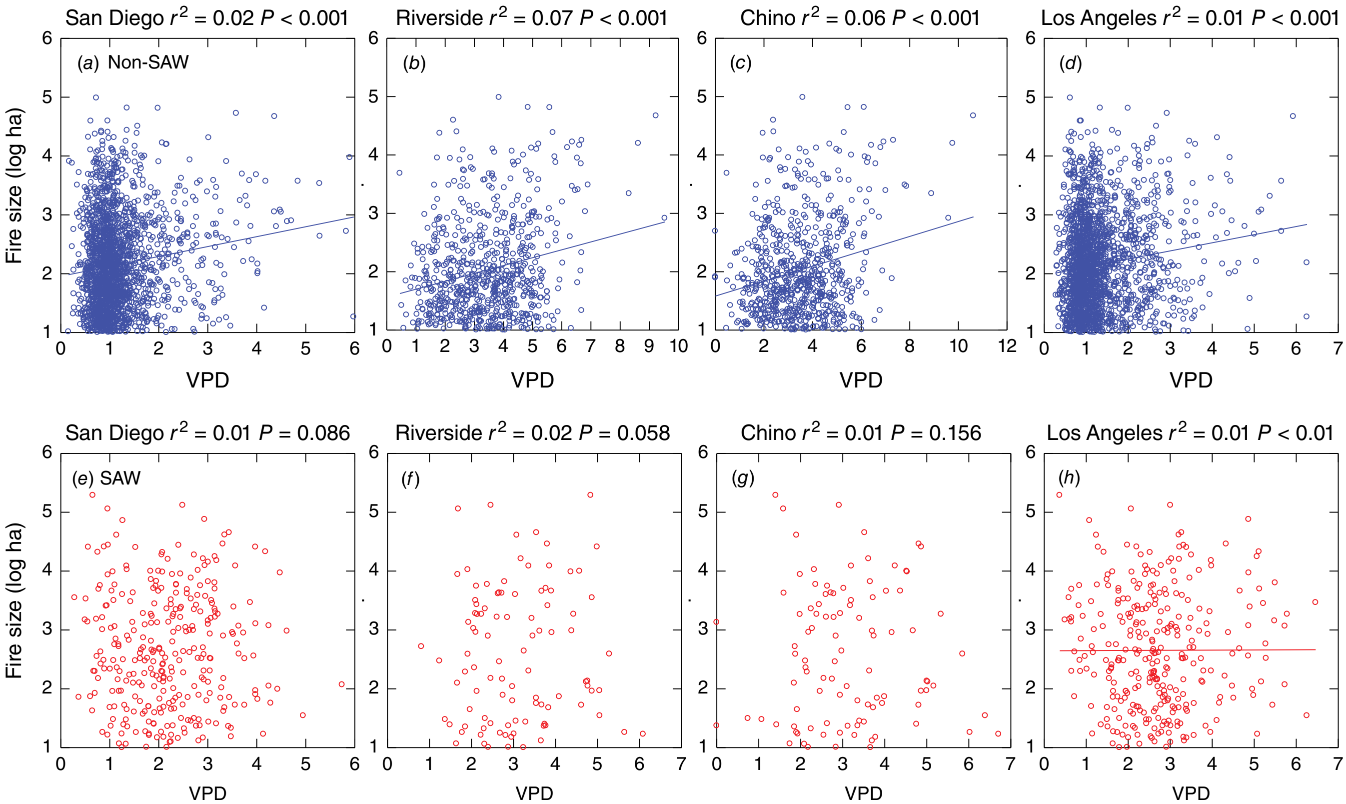

Fig. 6. Individual fires plotted by size for levels of VPD at the four climate stations; adjusted r^2 for bivariate regression of log ha and VPD. (*a*–*d*) Non-SAW in blue for the four stations, and (*e*–*h*) SAW in red for the four stations.

was little relationship between VPD and fire size (Fig. 6), there was a significantly higher VPD before and after days of ignition for megafires (Table 4).

The effect of the Palmer Drought Severity Index (PDSI) on fire size, considering PDSI vs monthly area burned for non-SAW and SAW days is illustrated in Fig. 7. For fires ignited on non-SAW days, bivariate regression analysis showed PDSI explained a substantial amount of variation in area burned, particularly in the months of January and February. For fires ignited on SAW days, there were significant effects of PDSI on fire size for the months from October to January.

Regression models of log area burned (Table 5) were developed on a monthly basis using all of the variables examined in this study. For fires ignited on non-SAW days in months with substantial area burned, variance accounted for between 0.05 and 0.16. Across all months the most important driver of fire size from non-SAW day ignitions was the extent of drought (PDSI) in the prior 5 years. For SAW days during October, the month with the largest area burned, the model was highly significant with an r^2 of 0.23 and the major driver was the SAWRI measure of wind speed. For the other 3 months with substantial area burned, the model for September did not yield significant results, but the models for November and December models were significant with the SAWRI also being the strongest driver.

Discussion

In southern California SAW fires are responsible for the largest and most destructive wildfires (Syphard *et al.* 2021; Abatzoglou *et al.* 2023), however, as shown here, fires ignited on non-SAW days account for many more fires than SAW fires (seven times as many) and more (30%) area burned. The proportion of non-SAW to SAW fires has varied somewhat over time, with some studies reporting more equal levels of burning for these two types of fire (Jin *et al.* 2014, 2015; Kolden and Abatzoglou 2018). Of particular interest is that extreme SAW events are not a good predictor of extreme fire events since they are entirely dependent on the coincidence of an extreme event with a human ignition, most commonly a powerline failure (Keeley *et al.* 2021). As noted here, the probability of a SAW event leading to a fire has increased significantly over the last 71 years. Since these fires are dependent on human ignitions, it is possible this increase is due to increased population growth and associated increase in the electrical grid. Global warming could be an explanation for this pattern except that climate attributes are not strongly tied to SAW fires (Keeley *et al.* 2021).

Non-SAW fires are often referred to as summer fires as the bulk of area burned occurs during the summer months June–August; however, much more area burned in September

Table 4. *t*-tests for difference between megafires (>25,000 ha) and small fires (100–999 ha) on day of ignition and the prior 5 days (-week) and the following 5 days (+week) for the two sites with long term records (1950–2020); for temperature, VPD, and average daily wind speed. Only months with sufficient number of large fires presented; (0) is the day of ignition, (1,2,3,4,5) is a day or days before or after the day of ignition, (wk) is average of day of ignition and prior 5 days or following 5 days; NS = $P > 0.05$, * = $P < 0.05$, ** = $P < 0.01$, *** = $P < 0.001$.

	Temperature		Wind speed		VPD	
	–Week	+Week	–Week	+Week	–Week	+Week
San Diego						
Month	Non-SAW		Non-SAW		Non-SAW	
7	NS	NS	NS	5**	NS	5*
8	NS	NS	3*wk*	1*	NS	NS
9	NS	NS	NS	NS	wk*	NS
	SAW		SAW		SAW	
9	NS	NS	NS	wk*	NS	NS
10	NS	NS	NS	NS	1*	NS
11	NS	NS	NS	NS	0***2*	NS
12	NS	NS	NS	5**	1***5**	wk*
Los Angeles						
Month	Non-SAW		Non-SAW		Non-SAW	
7	5***	NS	NS	3*	NS	NS
8	NS	NS	NS	NS	NS	NS
9	NS	wk**	3**wk*	NS	NS	4*5*
	SAW		SAW		SAW	
9	NS	NS	NS	NS	NS	wk*
10	NS	NS	NS	2*	1*	NS
11	NS	0***4*5**	NS	NS	0***2*	4**5***
12	NS	3** wk*	NS	2*4***	NS	3*

is due to non-SAW fires than SAW fires. SAW fires dominate in October through December. Although the frequency of non-SAW fires tends to be greatest in more interior landscapes (Kolden and Abatzoglou 2018), the distribution of large fires over 10,000 ha shows the main differences to be that SAW fires dominate in the southern part of the southern California region and non-SAW fires in the northern portion (Fig. 1).

Predicting the likelihood of both fire types is critical to providing sufficient fire protection and it appears the best predictors differ between these two types of fires. The CFWI has been used to predict fire conditions for SAW fires (Goss *et al.* 2020), and here we evaluated several indices derived from the CFWI to assess their relative utility for predicting both non-SAW and SAW fires. The Fire Weather Index (FWI) is commonly used as a general index of fire danger, and although it is significantly related to fire size for both non-SAW and SAW days (Fig. 2), its utility for predicting fire size is limited. This is because both non-SAW and SAW fires vary by 4–5 orders of magnitude annually, and models derived from the FWI explain very little of this year-to-year variance. In other words, despite the statistical association, indices such as FWI provide limited predictive value in southern California (Schoenberg *et al.* 2007). On the other hand, for all months with substantial area burned (June–September for non-SAW fires, October–December for SAW fires), days with an ignition have a FWI significantly greater than non-fire days in that month. Thus, at a monthly temporal scale, the FWI is a reliable indicator of fire potential for both types of fire.

Of particular value to fire managers is the capacity to predict conditions likely to lead to large fires, which are defined and labelled differently by researchers; very large wildfires (VLWF), extreme wildfire events (EWE), fires of unusual size (FOUS), and megafires are examples (Stavros *et al.* 2014; Tedim *et al.* 2018; Potter 2023; Linley *et al.* 2022, respectively). We prefer the latter term, in part because it doesn't carry an initialism. The threshold over which fires are categorised as large varies markedly with different regions, partially because the presence of contiguous fuels varies geographically and is an important contributor to potential fire size. Here we consider megafires as those >25,000 ha (61,775 ac), which in southern California is

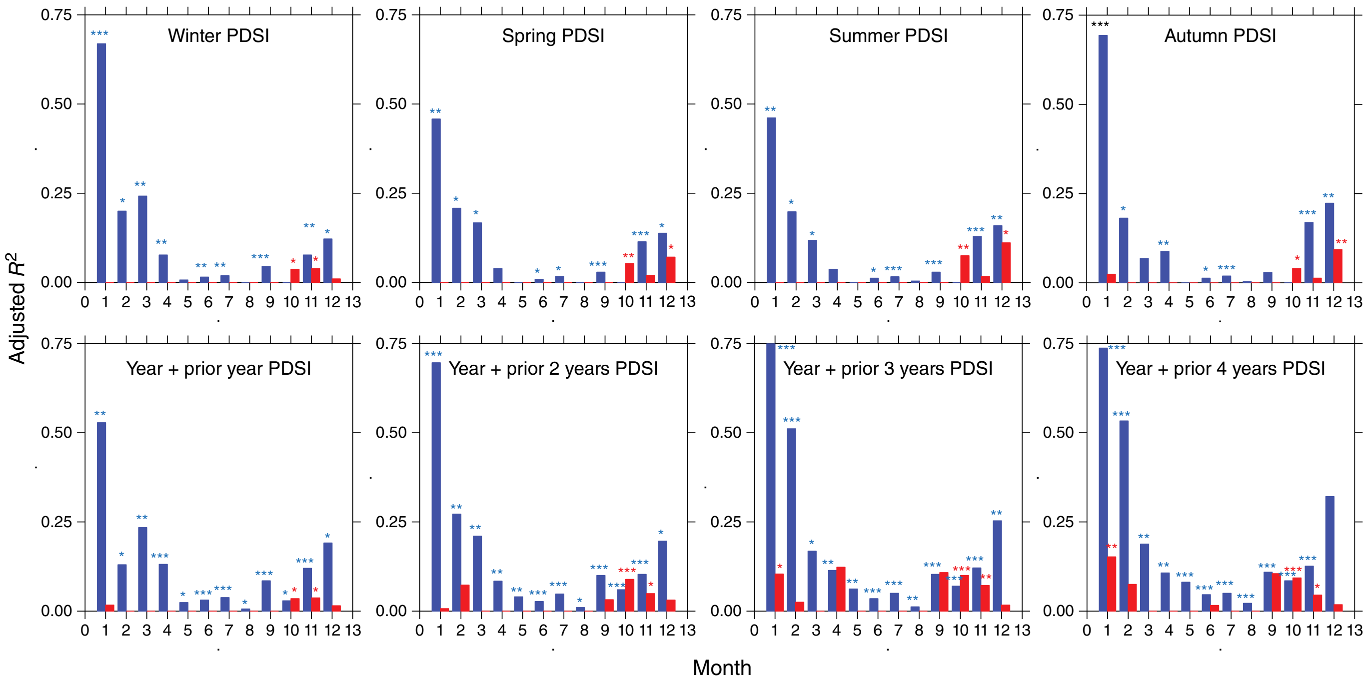

Fig. 7. Monthly distribution from January to December of the adjusted r^2 for bivariate regression of log ha and PDSI for each season, and average of annual PDSI plus PDSI for the prior year (2 years drought index), and prior 2 years (3 years drought), prior 3 years (4 years drought), and prior 4 years (5 years drought). *indicates $P < 0.05$, **$P < 0.01$, ***$P < 0.001$.

Table 5. Best regression models for all the parameters investigated here for SAW and non-SAW days for those months with a substantial area burned; day 0 = day of ignition; coefficients for the independent variables have been omitted.

	Non-SAW
Month	
5	Log ha burned = Drought prior 5 years + temperature (day 0); r^2 = 0.12, $P < 0.001$
6	Log ha burned = Drought prior 5 years; r^2 = 0.05, $P < 0.001$
7	Log ha burned = Drought prior 5 years + VPD (day 0); r^2 = 0.07, $P < 0.001$
8	Log ha burned = Drought prior 5 years + VPD (day 0) + Sum PDSI, Spring PDSI; r^2 = 0.06, $P < 0.001$
9	Log ha burned = Drought prior 5 years + VPD (day 0); r^2 = 0.16, $P < 0.001$
10	Log ha burned = Drought prior 5 years + VPD (day 0); r^2 = 0.11, $P < 0.001$
	SAW
Month	
10	Log ha burned = R1Dindex (day 0) + Spring PDSI + Summer PDSI; r^2 = 0.23, $P < 0.001$
11	Log ha burned = R1Dindex (day 0) + Drought prior 4years; r^2 = 0.29, $P < 0.001$
12	Log ha burned = R1Dindex (day 0) + Spring PDSI; r^2 = 0.11, $P < 0.01$

generally associated with the most destructive fires (Syphard *et al.* 2021). Conditions on the day of an ignition are important, but our results show that conditions in the days before and after ignition also need to be considered. For non-SAW fires, the FWI is of little value in discerning when fires would become megafires; however, FWI may be a good predictor of megafires during the SAW season (Table 2). In general, the FWI on the day of ignition is less useful than this index in the days before and after ignition.

The Fine Fuel Moisture Code (FFMC), is a numeric rating of the moisture content of dead fine fuels and is inversely tied to fire danger. This metric is significantly greater on days when a fire occurs, than on non-fire days, year round for non-SAW days and autumn and winter months for SAW days. In short, FFMC was greater on days when an ignition occurred; however, for most months the difference was rather subtle; typically just a few percent. As a metric for predicting megafires, it is of limited value for non-SAW days;

however, late fall and early winter SAW fires showed this had a significant effect on megafires, and this is consistent with the role of precipitation on these fires (Cayan *et al.* 2022). It would seem that this effect is primarily on dead fine fuels as fuel moisture in live fuels in autumn is frequently at its lowest point for living chaparral biomass in most years (Keeley *et al.* 2009). FFMC in the days following SAW fire ignition has the most consistently significant effect.

The Drought Code (DC) as a predictor of fires varies with location and length of the record. The present study showed that on non-SAW days it was generally greater on days when an ignition occurred, but for SAW days that was only the case for autumn months in the long-term data sets from San Diego and Los Angeles, and not for the more recent years for Riverside and Chino. As a predictor of megafires it is not significant for fires that ignite on non-SAW days, but it is significant for fires that ignite on SAW days in early autumn months. Models using the Palmer Drought Severity Index (PDSI), and temperature, average wind speed and VPD showed that long term drought was the most important determinant of fire size on non-SAW days. For SAW days, drought was an important factor, but the greatest impact was the SAW Regional Index. In short, drought appears to be the most important factor for non-SAW days and Santa Ana wind speed for SAW days (Table 5).

Vapour pressure deficit (VPD), has been shown to be highly correlated with area burned in the southwest USA (Mueller *et al.* 2020; Balch *et al.* 2022). In southern California VPD appears to be linked to megafires in July and September for non-SAW days and October–December on SAW days, but is not the overriding factor (Table 5).

In summary, when using the CFWI to predict fire occurrence potential in southern California, the FWI may be the most useful for both SAW and non-SAW fires, although using it in combination with the FFMC and DC may provide a more robust prediction. None of the three indices were valuable for predicting fire size overall, nor were they helpful in predicting megafires on non-SAW days. However, all three showed some potential for predicting SAW megafires in some months, although the effect was greater for the days before and after a fire. Of course, if used to predict the potential for a megafire, the weeks before the event would be the most useful to monitor for fire danger. In addition, long term drought needs to be considered in evaluating fire danger and the potential for human ignitions (Keeley *et al.* 2021).

Supplementary material

Supplementary material is available online.

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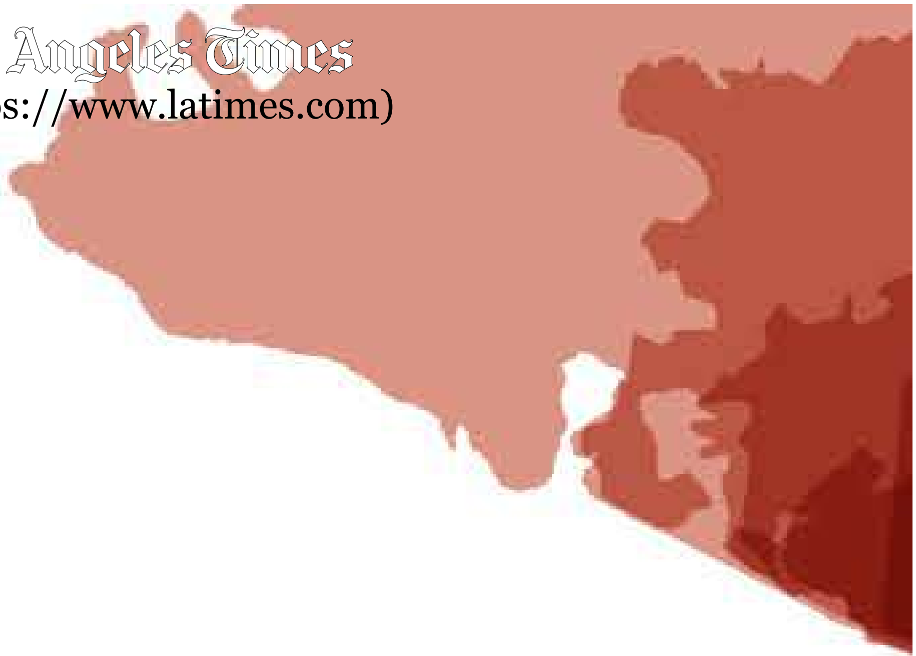
EXHIBIT B

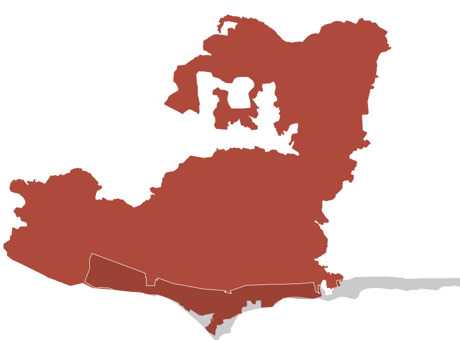


Malibu's wildfire history

By MATT STILES (HTTPS://WWW.LATIMES.COM/LA-BIO-MATT-STILES-STAFF.HTML), RYAN MENEZES (HTTPS://WWW.LATIMES.COM/LA-BIO-RYAN-MENEZES-STAFF.HTML) AND JON SCHLEUSS (HTTPS://WWW.LATIMES.COM/LA-BIO-JON-SCHLEUSS-STAFF.HTML)

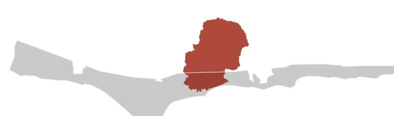
DEC. 12, 2018

In the last 90 years, at least 30 wildfires have burned parts of the upscale coastal community of Malibu. The recent Woolsey blaze (https://www.latimes.com/projects/la-me-malibu-woolsey-destruction-map/) was the largest, charring nearly 97,000 acres.



Woolsey, 2018

96,949 acres



Corral, 2007

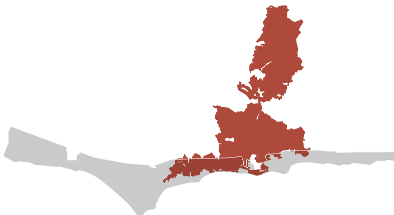
4,708 acres

Canyon, 2007

3,839 acres

Pacific, 2003

806 acres



Calabasas, 1996

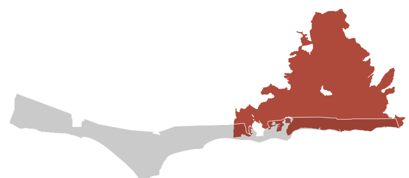
12,513 acres

Latigo, 1994

63 acres

Green Meadows, 1993

38,479 acres

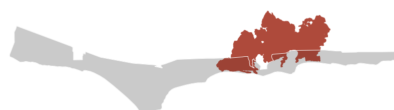


Old Topanga, 1993

16,468 acres

Decker, 1985

6,567 acres



Piuma, 1985

5,391 acres

Dayton Canyon, 1982

43,097 acres

Kanan, 1978

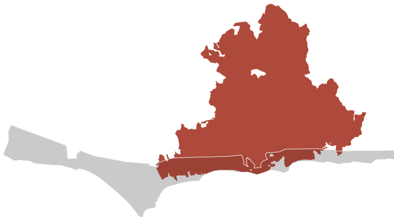
25,589 acres

Unnamed, 1978

60 acres

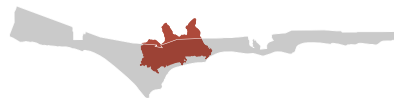
Trippet, 1973

2,831 acres



Wright, 1970

28,202 acres



Latigo, 1967

2,869 acres

Unnamed, 1959

36 acres

Unnamed, 1958

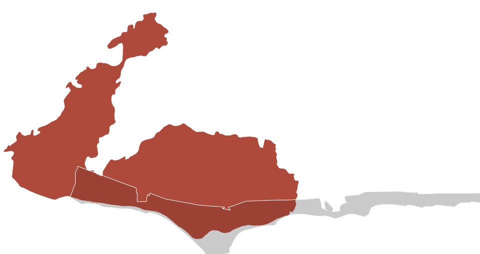
5,116 acres

Unnamed, 1958

18,120 acres

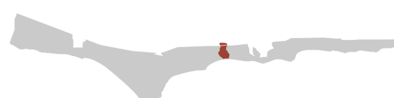
Hume, 1956

2,194 acres



Sherwood-Zuma, 1956

35,170 acres



Unnamed, 1953

169 acres

Miller, 1948

41 acres

Dume, 1946

213 acres

Woodland Hills, 1943

14,919 acres

Las Flores, 1942

5,841 acres

Topanga, 1938

14,532 acres

Malibu, 1935

28,195 acres

Potrero, 1930

8,783 acres

Las Flores, 1928

274 acres

Sources: California Department of Forestry and Fire Protection, Fire and Resource Assessment Program (http://frap.fire.ca.gov/data/frapgisdata-sw-fireperimeters_download)

More from the Los Angeles Times

(https://www.latimes.com/projects/la-me-malibu-woolsey-destruction-map/)

Woolsey fire home losses in Malibu top $1.6 billion (https://www.latimes.com/projects/la-me-malibu-woolsey-destruction-map/)

(https://www.latimes.com/projects/la-me-woolsey-fire-progression/)

Here's where the Woolsey fire burned (https://www.latimes.com/projects/la-me-woolsey-fire-progression/)

(http://www.latimes.com/local/lanow/la-me-wildfire-details-20181110-story.html)

Track key details of the California wildfires

(http://www.latimes.com/local/lanow/la-me-wildfire-details-20181110-story.html)

(http://www.latimes.com/local/lanow/la-me-rain-fires-california-20181113-story.html)

As autumn rain in California vanishes amid global warming, fires worsen

(http://www.latimes.com/local/lanow/la-me-rain-fires-california-20181113-story.html)

EXHIBIT C

NWS Los Angeles
@NWSLosAngeles

HEADS UP!!! A LIFE-THREATENING, DESTRUCTIVE, Widespread Windstorm is expected Tue afternoon-Weds morning across much of Ventura/LA Co. Areas not typically windy will be impacted. See graphic for areas of greatest concern. Stay indoors, away from windows, expect poweroutages. #LA

11:00 AM · Jan 6, 2025 · **876.7K** Views

EXHIBIT D

NWS Los Angeles
@NWSLosAngeles

Strong winds are coming. This is a Particularly Dangerous Situation - in other words, this is about as bad as it gets in terms of fire weather. Stay aware of your surroundings. Be ready to evacuate, especially if in a high fire risk area. Be careful with fire sources. #cawx

6:47 PM · Jan 6, 2025 · **160.7K** Views

EXHIBIT E

EXHIBIT E

WILDFIRES

Four fires grow, forcing more than 80,000 evacuations around L.A.

The Palisades Fire has already burned through almost 3,000 acres, while two other fires have destroyed a further 1,500 acres. Tens of thousands have been evacuated.

Thunder Beats Pacers to Win 1st NBA Title Since Oklahoma Move

00:46

00:02 / 00:45

Jan. 7, 2025, 1:07 PM PST / Updated Jan. 8, 2025, 10:27 AM PST

By Evan Bush

Four fast-moving fires have forced more than 80,000 residents to evacuate from the Pacific Palisades, Pasadena and Sylmar areas of Los Angeles amid "life-threatening and destructive" winds.

The Woodley Fire, the most recent, ignited around 6:15 a.m. PT and stretched 75 acres in the area of North Woodley Avenue and the Sepulveda Basin in the San Fernando Valley. It's being driven south by strong winds, and poses a threat of crossing Burbank Boulevard, according to Cal Fire.

The Palisades fire, which broke out Tuesday morning at about 10:30 a.m. local time, was burning in the Pacific Palisades Highlands community.

In just hours, the blaze had burned through 3,000 acres, according to the California Department of Forestry and Fire Protection (CalFire). It has been fueled by a combination of dry conditions and powerful winds, which are likely to strengthen further overnight. At least 30,000 residents were forced to evacuate the area.

As of Wednesday afternoon, the Palisades Fire had burned more than 5,000 acres and destroyed over 1,000 structures.

While the Eaton and Hurst fires – in Pasadena and Sylmar respectively – had last burned 1,500 acres between them, the Palisades fire had destroyed around double the area of land of the other two blazes put together. Gusts up to 100 mph are expected in the windiest spots.

The Palisades Fire

The fire is more than 1,200 acres in size.

Notes: Data as of Jan. 7. Because wildfires are clusters of fires, shapes represent areas in which fires are burning or have burned. Not every area inside a shape may have burned.

Source: CalFire

Graphic: Nigel Chiwaya / NBC News

Some 52,000 residents were under evacuation orders in the face of the Eaton fire, and an additional 47,000 residents are under evacuation warnings as of Wednesday morning, according to Angeles National Forest.

Mandatory evacuations are in also place near the Hurst Fire, burning north of San Fernando, for areas north of the 210 freeway from Roxford to the Interstate 5/14 freeway plot.

Kelsey Trainor, an attorney who lives in Pacific Palisades, said she fled her neighborhood around 11:30 a.m., only to get stuck in bumper-to-bumper traffic on Palisades Drive.

"It was all smoke around us, fire everywhere. People are just honking their horns," Trainor said. She said she felt stuck, with flames on both sides of the only road out. "Gridlock - nowhere to go."

Photos: Flames engulf Southern California as crews battle to control deadly fires

At least two people are dead, hundreds of buildings have burned and tens of thousands

Trainor briefly left her car to offer help and a mask to an elderly woman who was having difficulty breathing. Ash was pelting her face, driven by intense winds, she said.

Trainor said it took more than an hour to get to safety.

"What's really scary is that it felt really unsafe for people who were doing what they're supposed to be doing," Trainor said, noting that she had a stockpile of supplies and a "fire bag" packed and had left before her phone chimed with an emergency alert.

"It felt really helpless," she said.

More than 10,300 households and 13,200 structures were threatened by the fire as of Tuesday afternoon, Los Angeles Fire Chief Kristin M. Crowley said at in a news conference.

Fire chief on out-of-control LA wildfires, 'consistent' wind gusts

02:00

“We feel very blessed at this point that there’s no injuries that are reported,” Crowley said, but added that she had received reports of multiple structures damaged.

Flames could be seen popping up from condo buildings near Sunset Boulevard and from hillside homes.

Mallory Sobel, who lives in the Pacific Palisades Highlands neighborhood, said it took her two-and-a-half hours to drive out of the neighborhood, where homes were shadowed by plumes of thick smoke.

“I can feel it in my lungs right now. My throat is sore. My car was full of soot as I was making this slow, slow climb down. I wore a mask because it was that potent," Sobel said.

She added that she left with just a bag of emergency supplies and her family's passports.

“Good Samaritans are everywhere on the street, helping people navigate down the hill and helping people with their cars,” she said.

About 30 vehicles that had to be abandoned had to cleared by dozers to improve access for firefighters, according to the fire department.

Flames were also a threat to communities that dot the canyons west of Pacific Palisades, including those in Rustic Canyon and Topanga Canyon.

"Be prepared for evacuation orders to come through," Erik Scott, a public information officer with the L.A. Fire Department, said in a video on X addressing residents. Scott added that the fire was "rapidly spreading due to the significant winds."

Erik Scott
@PIOErikScott · **Follow**

#PalisadesFire; #PacificPalisades. #PIO Update. More info coming. LAFD.org/News for info. #LAFD #LACoFD

Watch on X

12:27 PM · Jan 7, 2025

124 Reply Copy link

Read 5 replies

Margaret Stewart, another LAFD public information officer, said over 250 firefighters were responding to the blaze. The fire was moving generally toward the west, she added, though firefighters were also concerned about swirling fires and spot fires in the canyons that could send embers in any direction.

"They can carry up to a mile," Stewart said.

Conditions in Southern California were primed for a fast-moving wildfire. Los Angeles has not received significant rainfall in months, and National Weather Service forecasters had predicted "a life-threatening, destructive windstorm" from Tuesday afternoon through Wednesday morning.

Rich Thompson, a weather service meteorologist based in Oxnard, said downtown Los Angeles has received just 0.16 inches of rain since July 1.

Thompson said the weather service observed wind gusts of 50 to 80 mph on Tuesday and expected the danger to grow overnight.

"It looks like the winds will increase a little in strength later today and tonight," he said. "The Hollywood Hills, Beverly Hills area, Palos Verdes – they get Santa Ana winds, but not usually this strong."

People flee the advancing Palisades Fire by car and on foot in Pacific Palisades, Calif., on Tuesday. Etienne Laurent / AP

Winter wildfires in California are often driven by the Santa Ana winds, which sweep down mountain slopes to bring hot, dry air to coastal areas. The winds typically lower humidity levels and can rapidly push any fires that start, particularly when the landscape is dry.

Climate change has increased the risk of such events, Daniel Swain, a climate scientist at UCLA, said in a YouTube address.

"Climate change is increasing the overlap between extremely dry vegetation conditions later in the season and the occurrence of these wind events," he said.

Thompson said the landscape would only become drier as the day wore on, a fearsome sign for firefighters.

"Humidities are starting to drop down in the 20 to 30% range and continue to drop down into the teens and single digits tomorrow and into Thursday," Thompson said, adding that "the wind will continue cranking tonight and tomorrow. There will be no relief."

Evan Bush

Evan Bush is a science reporter for NBC News.

Daniel Arkin, Chase Cain, Marlene Lenthang and Erick Mendoza contributed.

EXHIBIT F

Economic Toll of Los Angeles Fires Goes Far Beyond Destroyed Homes

The ongoing disaster will affect residents' health, local industries, public budgets and the cost of housing for years to come.

Listen to this article · 10:40 min Learn more

By Lydia DePillis

Jan. 15, 2025

After decades of mounting damage from climate-fueled natural disasters, researchers have compiled many misery-filled data sets that trace the economic fallout over weeks, months and years.

The fires still burning in Los Angeles are sure to rank among America's most expensive — but there is no perfect analogue for them, making it difficult to forecast the ultimate cost.

The main reason is that wildfires have typically burned in more rural locations, consuming fewer structures and attacking smaller metropolitan areas. The Los Angeles conflagration is more akin to a storm that hits a major coastal city, like Houston or New Orleans, causing major disruption for millions of people and businesses.

"It looks a lot more like the humanitarian situation from a flood or a hurricane than a wildfire that people are watching in the hills," said Amir Jina, an assistant professor at the University of Chicago's Harris School of Public Policy, who has studied the economic impact of climate change.

On the other hand, several mitigating factors could lead to lower costs and a stronger rebound relative to other places. The cinema capital's wealth and industrial diversity, along with other natural advantages from geography and weather, may allow Los Angeles to stave off a worst-case scenario.

Estimating the likely economic losses is tricky at this stage. The weather data company AccuWeather has offered a figure of $250 billion to $275 billion, though a Goldman Sachs report said it found the estimate high. (Declining to provide a breakdown because its methodology is "proprietary," AccuWeather said it considered many factors including long-run health impacts as well as short-term losses in the value of public companies exposed to the disaster.)

Here are some elements to account for when thinking about the total cost of the fires.

Physical Wreckage

The most straightforward component of damage is the number of structures damaged or destroyed, currently about 12,000. That's fewer than the 18,000 felled by the Camp fire in Northern California in 2018, but this is a different kind of house: Zillow values the average home in the Pacific Palisades ZIP code at $3.4 million; in Altadena's ZIP code, it's $1.3 million.

That's what is driving early estimates of insured losses progressively higher, now reaching $30 billion, according to Wells Fargo. But insurance will neither make all homeowners whole nor pay the full cost of rebuilding. Carriers have dropped thousands of policies in the affected areas in recent years, and the state-backed insurer of last resort caps coverage at $3 million per residential property.

Then there's the damage to commercial space. Although one landlord managed to protect an outdoor mall with privately hired water tankers, many other businesses were gutted.

These neighborhoods may be better able to recover than others hit by wildfire in recent years. The median annual household income in Pacific Palisades, for example, is more than $200,000, compared with about $80,000 nationally; in Altadena, it's $134,000.

Nonetheless, public funding will be needed to repair and reconstruct sewer systems, power lines and roads. Water infrastructure requires particular attention, since ash and contaminants can pollute drinking water far outside the burned areas.

"I'm not sure there's enough money to go around," said Margaret Walls, director of the Climate Risks and Resilience Program at Resources for the Future, an environmental think tank. "Communities haven't figured out how to pay for this."

Work Not Getting Done

Wildfires and hurricanes can have short- and long-term effects on employment and productivity. People who have evacuated may be unable to work, and the jobs based in the affected areas — such as landscaping, teaching school and providing health care — at least temporarily disappear.

Early data is trickling in. The fires haven't hit major employment centers or industrial facilities, but the number of total hours worked in Malibu and Pacific Palisades declined 57 percent the week the fires started relative to the prior week, according to Homebase, an operations platform for small businesses.

Analysts at Goldman Sachs forecast that the fires would knock 15,000 to 25,000 positions off the Labor Department's employment report for January. That's less than the hit from last summer's major hurricanes, after which people quickly returned to work.

But the damage doesn't end there. A study published this month in The Journal of Environmental Economics and Management found that large fires depress job creation in the affected counties. The effects rise with the share of the county's landmass that burned, and Los Angeles County is nearing the upper end of the scale.

Demario Ellis gave Tony Rodriguez a haircut on Monday at a gas station in Altadena that was turned into a makeshift donation center for victims of the Eaton fire. Philip Cheung for The New York Times

According to one of the authors, Raphaelle Gauvin-Coulombe, an assistant professor of economics at Middlebury College, a fire of this magnitude on average reduces monthly employment growth by 1.46 percentage points over three years. Los Angeles has a relatively varied industrial base, including manufacturing, higher education and technology along with entertainment, which could help it recover faster. On the other hand, it relies much more than the typical county on leisure and hospitality enterprises, which are extremely vulnerable to fire.

"If you rely a lot on visitors for your economy, the reduction in consumer demand will be especially important for the region," Dr. Gauvin-Coulombe said.

The study also found that a federal disaster declaration could substantially cushion those negative impacts by pumping billions of dollars into the community. That often leads to an increase in local economic output after disasters, despite the devastation.

But that money comes from somewhere, and the costs are rising. As one example, Congress had to replenish the Federal Emergency Management Agency's disaster relief fund after last year's hurricane season, and such supplemental appropriations have become larger and more frequent.

"That's tax money coming from me and you that could have gone to other uses if we weren't as exposed to this much risk," Dr. Jina said.

Long-Term Health Effects

The most immediate, concrete impact of the fires on human health is the body count: So far, 25 people are known to have died, with the tally likely to rise.

But that's only the beginning. Wildfire smoke has a range of ill effects, including asthma, cancer and preterm births, with children and those with respiratory conditions the most at risk. The particular poisons lofted into the air when houses and their contents burn, rather than just vegetation, could create even more complications.

Natural disasters also set off a series of events that lead to thousands of earlier deaths over more than a decade, research has found. People who are forced to flee their homes or who lose work opportunities deplete their financial resources, which can diminish access to regular health services. Compounding stress can lead to risky behaviors, and public resources are drained by disaster response, all of which adds up to additional loss of life.

Rising Cost of Living

California is an expensive place to live, and the fires are likely to supercharge that problem in the Los Angeles area, at least in the short term, as people displaced from the fires seek new places to live.

"I would look for rents to go up basically immediately," said Jeff Bellisario, executive director of the Bay Area Council Economic Institute. "We have very few vacant rental homes, so there's no real cushion within our housing market."

At the same time, an even more fundamental threat is growing: the rising cost of property insurance, which was already prohibitively expensive in many areas of California. When policies become unaffordable or unavailable, real estate starts to lose value, which can drain the wealth of families whose main financial asset is home equity.

Insurance will neither make all homeowners whole nor pay the full cost of rebuilding. Mark Abramson for The New York Times

Experts say the way to keep areas insurable is to make not just individual buildings, but whole communities, less flammable. That means retrofitting roofs and siding, adding sprinkler systems, clearing vegetation and undertaking a host of other measures that cost money and require constant vigilance.

According to Dr. Walls, it's the price people will need to pay for living in beautiful places next to wild landscapes. Thus far, homeowners have not been forced to shoulder the full cost of prevention.

"Do you really want to live there? Then you better invest in way more hazard mitigation than you're doing," she said. "They aren't really pricing the risks appropriately in California."

Possible Paths Forward

To a large degree, Los Angeles's recovery — and the distribution of harms and benefits — depends on policymakers.

With little intervention, wealthy individuals could assemble burned lots to build even larger estates in the still-breathtaking coastal locale. Private equity companies could buy up land at vastly reduced prices and wait for conditions to be ripe for rebuilding.

Alternatively, local government officials could encourage a pattern of reconstruction that eases the city's affordability problem. Turning some land back into open space while rezoning to build more units on less acreage would bolster the housing supply while allowing communities to be defended more easily.

"From a housing economist's perspective, if we have opportunities to build in a more dense multifamily way, we should," Mr. Bellisario said. "The 'but' is, we know we're in a wildfire damage zone — can you do it in a way that can be made safe and insurable and also house more people than maybe we did before?"

Adding more housing is probably necessary to stem the flow of people already moving out of California. Places hit by fire tend to lose population and not recover.

The good news is, retrofitting existing homes can be relatively affordable, and new communities built from scratch even more so, according to a study by the research group Headwaters Economics.

With large-scale disasters becoming more frequent, “we do not want to get to the point of normalizing it,” said Kimiko Barrett, an analyst with the firm. “We do know how to build things safer and smarter for this increasing reality we’re looking at.”

Lydia DePillis reports on the American economy. She has been a journalist since 2009, and can be reached at lydia.depillis@nytimes.com. More about Lydia DePillis

A version of this article appears in print on , Section B, Page 1 of the New York edition with the headline: An Inferno’s Economic Toll

EXHIBIT G

PLANTS

Boiling won't help. Explaining the Palisades and Altadena 'Do Not Use' water alerts

(Jim Cooke / Los Angeles Times)

By Jeanette Marantos
Staff Writer

Jan. 22, 2025 **Updated** 1:59 PM PT

• Eight water districts have issued water advisories in L.A. County because of the Palisades and Eaton fires. There are concerns that the water might be contaminated by toxins from the fires.

- If water systems lose pressure during urban wildfires, it allows bacteria and contaminants such as volatile organic compounds (VOCs) to get into the water.
- People's homes and offices contain materials that turn into toxic vapor once those materials burn, releasing VOCs including benzene into the air that infiltrate compromised water systems. This is why boiling water with suspected VOCs is dangerous.

At least eight water districts in Los Angeles County — six in the Altadena area and two in the Malibu/Palisades area — have issued do-not-use or do-not-drink water advisories since the Eaton and Palisades fires began burning earlier this month, meaning customers should not use that water until they get the all-clear.

If you're wondering how fires can make drinking water dangerous, the first thing to understand is this: The structures where we work and shop, dine and sleep and just generally live our lives are full of materials that release toxic waste when those materials burn.

The examples are numerous. Couches and mattresses, TVs and refrigerators, tires and toys, even clothes are full of polyurethane and plastics, which vaporize into a toxic smoke once they're set on fire, said Dr. Gina Solomon, chief of the Division of Occupational, Environmental and Climate Medicine at UC San Francisco.

On Jan. 8, almost all that remained of the homes at Rubio Canyon and East Alta Loma Drive was smoke and ash after the Eaton fire roared through Altadena. (G.L. Askew II)

These toxins — many of which are known as VOCs, or volatile organic compounds — include chemicals such as benzene, which is used to make just about everything in the modern world, from plastics and gasoline to detergents and pesticides. As a liquid or vapor, though, benzene is a carcinogen if ingested or inhaled. Longtime exposure damages bone marrow, which is why it's linked to leukemia.

Most studies about benzene are based on many years of exposure, Solomon said. “What a few months does, nobody knows exactly, but nobody wants to find out,” she said. “We don’t want to use the population of burn zones to see what months or weeks of exposure does. We want to just avoid exposure in those areas.”

How can these toxins get into water systems?

If a water system loses water pressure, that allows contaminants such as bacteria and vaporized VOCs and other toxic chemicals to get inside, Solomon said.

“Normally our water systems have positive pressure — they’re full of water, so nothing can get in the pipes,” she said. But if the pipes lose pressure, such as water hydrants running dry, “It can create situations where you get suction instead of pressure, and in this case, it’s not a backflow of [contaminated] water but air full of toxic chemicals, including VOCs.”

Solomon studied this phenomenon after the Camp fire destroyed about 18,000 structures in the Northern California town of Paradise in November 2018. In a second study, “Organic Chemical Contaminants in Water System Infrastructure Following Wildfire,” she and other researchers identified 95 contaminants in water systems that came not just from melted pipes but also from “the intrusion of smoke” after the Camp fire in Paradise and the 2017 Tubbs fire in Santa Rosa.

A home on El Medio Avenue in Pacific Palisades burns on the night of Jan. 7 during the Palisades fire. (Brian van der Brug / Los Angeles Times)

Only one neighborhood in Santa Rosa — Fountain Grove — lost water pressure during the Tubbs fire, Solomon said. The hydrants there ran dry, and the water to the neighborhood's surviving 13 homes developed a contamination problem. Residents reported that their water smelled like gasoline, she said, and testing revealed benzene contamination for reasons investigators couldn't explain.

"That was our first hint," Solomon said. Researchers didn't really understand what was happening, however, until after they were able to do more extensive testing on the drinking water for the 1,200 surviving homes in Paradise. That's when they learned that VOCs and other contaminants could enter the drinking water even in a smoke or gas form if the water systems lost pressure.

As a result of their findings, the state Assembly passed a new law, California Health and Safety Code Section 116596, that went into effect Jan. 1, 2024, mandating that if a structure or structures burn in a wildfire of 300 acres or more, water districts must test their water and deem it free of contaminants before it can be used by customers.

“So basically we are guilty until proven innocent, based on this law,” said Tom Majich, general manager of the Kinneloa Irrigation District, the smallest of the five water districts in the Altadena area with water advisories. “And I’m not saying that’s wrong. Some of us may be guilty, but I just want people to understand that putting out a [water advisory] notice doesn’t mean you have a problem. We’re just following the law.”

Majich is awaiting his district’s test results, and he’s hopeful his system will be deemed safe. The district’s water system did not lose pressure, he said, and less than 7% of the district’s 600 customers — roughly 40 structures — were burned in the fire. “My personal opinion is that our water system was not compromised, but the law says that doesn’t matter,” Majich said. “If you lose a house, you do the testing, so we’re waiting for the results.”

The other Altadena-area districts with water advisories are Las Flores Water Co., Lincoln Avenue Water Co., Pasadena Water and Power (in the northeastern part of the district) and Rubio Cañon Land & Water Assn. Water advisories also have been issued by Los Angeles Department of Water & Power for the Palisades area and for Los Angeles County Waterworks District 29 in Malibu. The city of Sierra Madre, which is southeast of Altadena, has also issued an unsafe water alert for areas north of Grandview Avenue.

Majich said he doesn't know when his district's test results will be in. He speculated that other water districts haven't had a chance to test yet because their offices and systems were so badly damaged in the fire. "They're still really in crisis mode," he said. Calls to the other districts for comment were not returned.

Why can't you boil your suspect water?

Boiling can eliminate bacteria, another concern in contaminated water systems. What's dangerous is when the water is full of volatile organic compounds, Solomon said, because "when you boil the water, it releases benzene and other chemicals into your kitchen."

Hot showers or baths can vaporize those chemicals too, and if there's bacteria in the water, it could splash in your eyes, nose or mouth. That's why most of the water advisories have do-not-use alerts until the systems can be thoroughly tested, repaired and cleaned.

A gutted washer and dryer are among the ashy remains of a home destroyed by the Eaton fire on Wapello Street in Altadena. (Ringo Chiu / For The Times)

Sometimes the closures are just precautionary, Solomon said, and can be quickly resolved once officials determine that water is safe. But in Paradise, several systems had to be repeatedly flushed because most water pipes are coated on the inside with biofilm, microorganisms that attach to surfaces "that absorb and hold on to all the toxic chemicals," she said.

"Once the biofilm is contaminated, it's difficult to get those chemicals back out of the pipes. In Paradise, they had to flush the entire water system seven times, and some of those service lines [between water mains and houses] were so contaminated they had to go in and dig them up and just replace them," Solomon said. "So basically what we saw in Paradise was about a six-month process, and I think we can anticipate a similar time frame in the most impacted parts of L.A."

Once a water system gets the all-clear, people should feel confident about the quality of their drinking water, Solomon said. "I know a lot of people will be fearful, and may not trust the results, but I have great faith in the actual testing data," she said. "Once they've done the testing, and the area is negative [for contaminants], it means people can breathe a sigh of relief that they're not in an area impacted by water hazard."

A smoky haze fills the dusk landscape as a home smolders in the foreground during the Eaton fire in Altadena on Jan. 8. (Gina Ferazzi / Los Angeles Times)

Can you do anything safely with suspect water?

Basically, Solomon said, water with suspected contaminants should be avoided.

That means:

- No bathing or showering in the water (even cold showers could be dangerous if the water gets in your eyes, nose or mouth).
- No cooking or making ice.
- No teeth brushing.
- No washing dishes (since hot or warm water could release the toxins).
- Pets should not drink the water either.

Solomon said she's not sure how watering plants outside would be affected. VOCs would evaporate in sunlight, she said, but there hasn't been much research on what other potential contaminants could do.

The safest course, she said, is to just not use the water until it's deemed safe.

Vegetables, fruits and plants growing outdoors shouldn't be adversely affected by the water either, she said. The bigger concern outdoors is stirring up the ash from burned-up structures, which is also full of toxins, Solomon said, so be sure to wear gloves and an N95 mask to avoid inhaling the ash.

More to Read

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May 29, 2025

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May 16, 2025

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May 13, 2025

Updates

1:59 p.m. Jan. 22, 2025: The city of Sierra Madre has also issued an unsafe water alert for areas north of Grandview Avenue.

Jeanette Marantos

Jeanette Marantos is a Features reporter focused primarily on plants, gardening and Southern California's changing landscapes for the Los Angeles Times. She also writes the monthly L.A. Times Plants newsletter, which includes a calendar of upcoming plant-related events. Email calendar submissions or plant-related story ideas to jeanette.marantos@latimes.com for consideration.

Information

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Organic Chemical Contaminants in Water System Infrastructure Following Wildfire

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Abstract

Wildfires have destroyed multiple residential communities in California in recent years. After fires in 2017 and 2018, high concentrations of benzene and other volatile organic compounds (VOCs) were found in public drinking water systems in fire-affected areas. The sources of the contamination and appropriate remediation have been urgent matters for investigation. This study characterizes target and non-target VOCs and semi volatile organic compounds (SVOCs) in water from a highly contaminated service line after the 2018 Camp Fire (Paradise, CA). Ninety-five organic compounds were identified or tentatively identified in the service line. Laboratory combustion experiments with drinking water pipes made of polyvinyl chloride (PVC), cross-linked polyethylene (PEX) and high-density polyethylene (HDPE) and a review of the literature were used to evaluate potential sources of the detected chemicals. Among the service line contaminants were thirty-two compounds associated with PVC pyrolysis and twenty-eight organic compounds also associated with the pyrolysis of polyethylene. The service line sample also contained fifty-five compounds associated with uncontrolled burning of biomass and waste materials. The findings support hypotheses that wildfires can contaminate drinking water systems both by thermal damage to plastic pipes and intrusion of smoke. Residual chlorine disinfectant in the water system modifies the contaminant distribution observed.

Graphical Abstract

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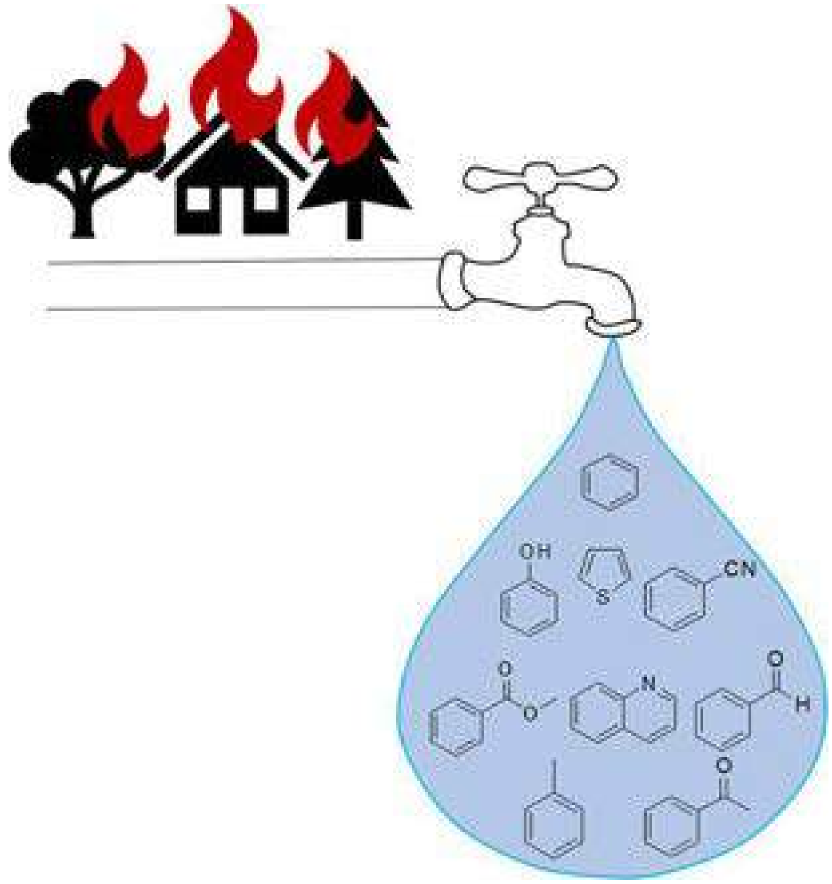
Supporting Information
The Supporting Information is available free of charge at https:/pubs.acs.org/doi/…
Additional data and experimental details, combustion simulations and combustion product databases.



Keywords

drinking water infrastructure; wildfire damage; organic chemical contaminants; sources; mechanisms

INTRODUCTION

There has been considerable recent interest in the impacts of wildfire on water quality.[1,2] In 2017, drinking water in a neighborhood in Santa Rosa, California destroyed by wildfire was discovered to be contaminated by relatively high concentrations of volatile organic chemicals (VOCs) including benzene.[3] The origin of these contaminants was not well understood but two sources were theorized: 1) thermal damage to plastic plumbing materials and appurtenances[4,3,5] and 2) intrusion of combustion products into service lines.[4,3] Distribution system dewatering relating to both fire suppression activities and system leaks may lead to entry of gaseous combustion products, soot, and ash.

There is considerable literature on the incineration of plastics. PVC combustion products include aliphatic, aromatic, halogenated, oxygenated and nitrogenated compounds.[6,7] Benzene is the major constituent of PVC pyrolysis oil[6] and numerous thermal degradation products of PVC and polyethylene polymers have been identified.[7,8,9] Recent laboratory studies confirm that thermally-damaged plastic pipes release benzene, toluene, ethylbenzene and xylenes (BTEX) to water.[4,5] Yet there is a paucity of information on water contamination related to burning structures and cellulosic biomass.[5] If damaged plastic pipes are indeed the principal contaminant source, it is not established which materials are optimal in fire-prone communities.[4] PVC, for example, is inherently fire resistant when compared to other plastics due to elevated ignition temperature.

On November 8, 2018, the Camp Fire destroyed over 18,000 homes and other buildings in the town of Paradise, California and nearby communities; approximately 1,700 homes were left standing in the area. Due to prior discovery of VOCs in drinking water after the 2017 Tubbs Fire in Santa Rosa, the local water utilities and California Division of Drinking Water collected water samples after the Camp Fire to screen for contaminants. VOCs were widely detected in Paradise and surrounding areas in service lines and smaller water mains, but not in water treatment plants or large water mains. Spatial distribution analysis demonstrated that leaking underground fuel tanks did not contribute significantly to the contamination.[10,11]

Removal of VOC contamination required numerous rounds of continuous flushing depending on contaminant levels.[12,3] This may be because some plastic pipes have a substantial capacity to sorb contaminants[13] potentially serving as a long-term contamination reservoir. Alternative remediation strategies involved limited or complete replacement of contaminated pipes at huge cost[4] and long delays to reestablish safe drinking water supplies. Previous investigators emphasize that the exact causes of water system contamination after wildfire are unknown due to insufficient data.[3] A lack of scientific information confounds attempts to develop recommendations and policies regarding design of resilient infrastructure in fire-prone communities and appropriate testing and remediation strategies after a fire.

The purpose of this study was to fully characterize organic chemical contaminants in a highly contaminated service line from the 2018 Camp Fire in an attempt to better understand potential source(s) of the contamination. This was accomplished by chemical analysis of a highly contaminated water sample obtained from the burn zone 11 weeks after the fire. At the study location the home had burned to the ground and both the service line and water main had remained dewatered for 6–8 weeks after the fire. A surveillance sample tested for VOCs nine weeks after the fire, after rewatering and then stagnation of water in the line for several days prior to sampling, contained 923 μg/L of benzene, nearly 1000-times the regulatory Maximum Contaminant Level (MCL) for this contaminant. This was the highest concentration of benzene reported in a drinking water system sample after the fire. This service line was constructed of HDPE on both the water system side (before the water meter) and leading to the residence. The destroyed residential structure itself had copper water lines. The water main serving the service line was PVC C900 and water mains and service lines at this location had all been installed in 2008. Target and non-target analysis of the sample was conducted to identify a broader list of contaminants in the water. Interpretation of the origins of the contaminants was then aided by both laboratory simulations of contaminant transfer to water from fire-damaged plastic pipes as well as combustion literature related to plastics, biomass, building materials and other fuels likely consumed in wildland-urban fires.

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MATERIALS AND METHODS

Burn Zone Water Samples.

Drinking water was obtained from a contaminated service line on Jan 31, 2019 in the community burn zone of the November 8, 2018 Camp Fire, the most destructive and deadly wildfire in California history. Unimpacted drinking water samples were obtained from the Paradise, CA water treatment plant for use as controls – water samples obtained at the drinking water treatment plant 11 weeks after the fire did not exceed federal or state primary drinking water standards. VOC sampling technique was used including collection in zero-headspace glass containers, i.e., 40 mL volatile organic analysis (VOA) vials or one-liter glass bottles filled without headspace. Samples were chilled at collection and transported to the laboratory at 4°C on water ice and analyzed within 14 days of collection. Additional burn zone samples were analyzed including the adjacent water main as well as the service line which was resampled a month later.

Materials.

Polyvinyl chloride (PVC) tubing (Product ID: ½ IPS Schedule 40; 600 psi @ 73°C; ASTM D1784-96b), PVC joint (Product ID: 049081137502), PVC primer (P-70™ Primer, purple) and PVC glue (Weld-On® 705™ PVC), Cross-linked polyethylene (PEX) tubing (Product ID: 6 97285 36005; SDR9 PEX 5106) were obtained at a local supplier. High-density polyethylene (HDPE) (SKU: # BLK IPS 0300 DR17 040; 3” IPS SDR17PE4710 Black) tubing was obtained commercially (HDPE Supply, Duluth, MN). Laboratory reagent water was prepared with a Millipore Milli-Q Gradient A10 water purification system equipped with ion exchange resins, charcoal filter and UV lamp (Billerica, MA, USA).

Chemical analysis of water for VOCs and SVOCs.

The majority of the analytical testing focused on VOCs determined by purge and trap (P &T) electron ionization (EI) GC-MS using a Hewlett Packard 5973 instrument equipped with a 30 m × 0.25 mm id × 1.4 μm DB-5 column. A Vocarb 3000 trap was used and the purge cell volume was 25 mL. The mass spectrometer was autotuned and multipoint calibrated with 60 regulated VOC compounds for target compound analysis – samples were fortified with 10 μg/L of fluorobenzene internal standard (IS) and 10 μg/L each of 4-bromofluorobenzene and 1,2-dichlorobenzene-d_4 surrogates to monitor analyte recovery. Non-target compounds were identified using computerized search of the NIST 17 and Wiley 11 NBS libraries. Peak deconvolution software (AMDIS Ver. 2.73, 2017) was used to improve the accuracy and fidelity of spectra and assignments were verified by manual inspection of spectra. For target compounds identification was based on both mass spectra and retention times. Non-target compound concentrations were estimated by comparison to averaged internal standard response factors.

The Camp Fire water sample was also analyzed for SVOCs which were determined by solid phase extraction (SPE) using hydrophilic-lipophilic balance (HLB) cartridges (Waters, Part # WAT106202)(200 mg; 30 μm; 500 mL load volume). HLB cartridges were conditioned with methylene chloride (5 mL), methanol (5 mL) and reagent water (10 mL) before extracting 250 mL water samples. Compounds were eluted with methylene chloride and the extract was concentrated to 0.25 mL under nitrogen. SPE extracts were introduced to a Hewlett Packard 5973 EI GC-MS instrument fitted with split-splitless inlet and a 30 m × 0.25 mm id × 25 μm DB-5 column. Compounds were identified by computerized search using NIST 17 and Wiley 11 mass spectral libraries and AMDIS (Ver. 2.73, 2017) software was used as needed.

Pyrolysis and Combustion Simulations.

Simulations were conducted in the laboratory to characterize VOC combustion products from plastic plumbing materials – SVOC compounds were not analyzed in these experiments. PVC tubing (3.5 inch) with glued joints (2 inch) was heated with a heat gun or under a methylacetylene-propadiene propane (MAPP) torch flame under various conditions in open air prior to immersion of test samples in 250 mL of reagent water. The heat gun attains a maximum temperature of ~175°C whereas the air supplied MAPP torch reaches 2050°C at the flame tip.

PVC pipe sections were glued according to manufacturer instructions (e.g., prime, allow to dry 2 min, apply glue to surfaces, join pieces and cure at room temperature (RT)). Five conditions were examined: 1) control – cured pipe joint immersed in reagent water with no headspace; 2) cured pipe joint heated with a heat gun until melting and reaching 100°C; 3) cured pipe joint heated with a heat gun until charring and reaching 102°C; 4) cured pipe joint exposed to MAPP flame until melting and reaching 150°C; and 5) cured pipe joint exposed to MAPP flame until charring and reaching 150°C.

Plastic temperatures were determined with an non-contact IR thermometer (Omega Model OS-DT8855W, Omega Engineering, Stamford, CT) and treated plastic samples were then transferred immediately to zero headspace glassware and immersed in water for 24 or 72 hours to extract contaminants. An emissivity setting of 0.93, typical of plastic emission coefficients, was used for the IR thermometer measurements. Forty mL water samples withdrawn at 24 hours were replaced with reagent water to avoid headspace in the 250 ml bottles. At 72 hours the water samples withdrawn (also 40 mL) were replaced with reagent water containing 228 μL of sodium hypochlorite (3,280 mg/L free chlorine) to obtain a free chlorine concentration of ~2.5 mg/L (ppm). Thus, PVC samples were analyzed at 24 hours, 72 hours and 168 hours – only the final sample having been treated with chlorine for a total of 96 hours.

Similar experiments were conducted with HDPE and PEX plastics although use of the heat gun was discontinued and no glue or primer was used. PEX experiments were conducted using 4-inch tubing. HDPE experiments were conducted using a strip (5-inch length, 1-inch width) cut from the HDPE pipe. Both PEX and HDPE samples were exposed to the MAPP flame inside and out until charred and unheated controls were also maintained as in the PVC experiments. On exposure to flame both PEX and HDPE surface temperatures were considerably higher (e.g., reaching 250 – 400°C) due to ignition of accumulated pyrolysis oils whereas PVC did not ignite under conditions studied.

In the case of PEX and using the protocol described previously, water samples were withdrawn for chemical analysis at 6 hours, replenished with reagent water and resampled at 100 hours. After replenishing with sodium hypochlorite solution samples were withdrawn at 168 hours for chlorine exposure of 68 hrs. In the case of HDPE water samples were withdrawn for chemical analysis at 4 hours, replenished with reagent water and resampled at 72 hours. After then replenishing with sodium hypochlorite solution, samples were withdrawn at 168 hours resulting in chlorine exposure of 96 hours.

Databases.

We reviewed literature on pyrolysis and combustion of plastics, building materials, biomass and uncontrolled burning of waste materials. Organic chemical compounds were compiled in two tables that appear in the Supporting Information (SI) section, one for combustion products produced by plastic materials (626 compounds) (Table S-6) and another for combustion products of biomass, building materials, etc. (369 compounds) (Table S-7). We compiled compound name, CAS number, formula, monoisotopic mass and source descriptors. The organic compounds in Table S-6 are combustion products of PVC, PEX, HDPE, PE, chlorinated polyvinyl chloride (CPVC), polypropylene (PP) and other plastics used in water distribution systems such as sealing materials, gaskets, O-rings, lubricants and thread compounds. We included chemicals identified as leachates from virgin plastic pipe materials as well.[14,15,16,17,18] Information on products related to PVC and PE were primarily obtained from Aracil et al.[7,8,9] Compounds identified in the present laboratory simulations of PVC, PEX and HDPE also are included. Information about plastic pipe leachates was obtained primarily from Pizzurro et al.[14]

Table S-7 compiles combustion products related to forest fires and structure fires. These include combustion products of a multitude of materials (e.g., biomass, building materials, furnishings, upholstery, paints, tires, liquid fuel, household wastes, etc). Table S-7 information was obtained largely from Lemieux et al.[19] Other references provided information on low-molecular-weight combustion products from burning of soft and hardwoods[20,21,22] and live or dead vegetation.[23]

These databases are useful for interpretation of mass spectral information as most of the compounds are compiled in EI mass spectral libraries. Additionally, information on monoisotopic masses and empirical formulas can be used for alternative mass spectrometry techniques such as electrospray LC-MS, chemical ionization GC-MS and high-resolution accurate mass MS.[24] Electronic versions of these databases can be obtained by contacting the corresponding author.

RESULTS

Contaminants in the Drinking Water Service Line.

The service line sample contained very high contaminant concentrations (Table 1): benzene (2,200 μg/L); naphthalene (690 μg/L); toluene (680 μg/L); styrene (380 μg/L); indene (230 μg/L); 2,3-benzofuran (200 μg/L); ethylbenzene (76 μg/L); xylenes (68 μg/L); 1-ethenyl-2-methylbenzene (59 μg/L); and 2-methyl-1-benzofuran (53 μg/L). The most abundant SVOCs (Table 2) were: benzonitrile (310 μg/L); acetophenone (130 μg/L); naphthalene (100 μg/L); benzaldehyde (71 μg/L); methyl benzoate (60 μg/L); 2-chloro-1-phenylethanol (52 μg/L); phenol (50 μg/L); 2-(3-chloro-2-propenyl)-phenol (two isomers 50 and 32 μg/L);

2-methylbenzonitrile (46 μg/L); 4-methylphenol (29 μg/L); and 2-phenylpropane-1,2-diol (28 μg/L). Additional data for VOCs and SVOCs appear in Tables S-1 and S-2, respectively.

Additional Burn Zone Samples.

Samples were collected 11 weeks after the fire from the water treatment plant, water main and the service line. In addition, service line sampling was conducted 15 weeks after fire. The highest concentration VOCs (benzene, naphthalene, toluene and styrene) detected in these locations were plotted (Figure 1). These VOCs were not detected in the water coming from the treatment plant. Additional drinking water samples analyzed exhibited a similar pattern of the major VOC contaminants but with a steep concentration gradient between the service line and adjacent water main.

Simulated Combustion of Plastic Pipes in the Laboratory: PVC.

In the laboratory PVC was subjected to heat and open flame prior to immersion in water to identify combustion products. In controls (e.g., without heat or flame) PVC tubing released 6 compounds: oxolane (THF), butan-2-one (MEK), cyclohexanone, propan-2-one (acetone), chloromethane and 2,3-dihydrofuran (Figure 2). VOCs increased 3-fold between 24 and 72 hr. Each compound, with the exception of chloromethane, was an ingredient in the glue or primer used to join pipe sections. An identical glued pipe charred with a torch prior to soaking in water for 72 hours released higher concentrations of the primer/glue solvents, e.g., MEK and THF were increased by about 27 and 56%, respectively. Heating with the torch also visibly swelled the glued joints.

PVC polymer pyrolysis products found included chloromethane (860 μg/L), 2-ethylhexan-1-ol (88 μg/L), benzene (18 μg/L), 2-methylpropyl 2-methylprop-2-enoate (isobutyl methacrylate) (7.2 μg/L), 2-ethylhexanal (2.6 μg/L) and 2-ethylhexyl acetate (2.1 μg/L). Additional data from PVC combustion experiments appear in Table S-3.

PEX and HDPE.

In lab simulations with PE pipes a somewhat different set of combustion products was found. The PEX control released no VOCs while HDPE controls contained traces of methylcyclopentane after 3 days immersion in water. PEX exposed to flame ignited and reached temperatures of 250 – 300°C -- its principal products after 100 hours were 2-methylprop-1-ene, propene, hex-1-ene, pent-1-ene, benzene, pentane and hept-1-ene (Table S-4). HDPE also ignited with surface temperatures reaching 375 to 400°C. HDPE combustion products were similar to those from PEX and included 2-methylprop-1-ene, propene, hex-1-ene, pent-1-ene, benzene, pentane, hept-1-ene, naphthalene, aldehydes (e.g., nonanal, octanal, pentanal, decanal, undecanal) and ketones (e.g., nonan-2-one, decan-5-one, decan-2-one, undecan-2-one (Table S-5).

Chlorine Reactivity.

Many of the combustion products from the polyethylene plastics reacted with chlorine in lab simulations including: 2-methylprop-1-ene, propene, hex-1-ene, hept-1-ene, 1,3-pentadiene, 2-methyl-1,3-pentadiene, 1-methylcyclopentene, oct-1-ene and 1-pentene (Figure 3). Possible halogenated disinfection-by-products (DBPs) detected in laboratory experiments included 3-chloro-2-methylprop-1-ene, 1-chloro-2-methylprop-1-ene and 1-bromobut-2-ene (Table S-5). Additional chlorine reactivity data appear in Tables S-3, S-4 and S-5.

DISCUSSION

Chemical Contaminants in the Drinking Water Service Line.

The wildfire contaminated drinking water sample contained a complex mixture of VOCs and SVOCs with high concentrations of some compounds. Of the 53 VOCs detected 45 (85%) were non-target compounds. We identified or tentatively identified a total of 95 compounds in the service line sample (Tables 1 and 2), nineteen of which were determined by both purge and trap GC-MS and solid phase extraction GC-MS. The most abundant VOCs and SVOCs are simple substituted benzenes (Figure 4).

Many additional target and non-target substances were identified (Tables S-1 and S-2) including: substituted benzenes; polycyclic aromatic hydrocarbons; N-heterocycles; O-heterocycles; S-heterocycles; phenols/alcohols; ketones; aldehydes; chlorinated compounds; cyano compounds; alkenes and carboxylate esters. Many of these compounds have strong odors, e.g., sulfur compounds, ketones, aldehydes, esters, phenols and aromatics. Some returning community members reported strong odors in their drinking water[3] and odors were also noted by water system personnel. In fact, one of the initial goals at our laboratory was to identify the odorous contaminants.

Limited comparative analyses of additional fire zone samples demonstrated that the contamination pattern was representative of the drinking water distribution system, but that the concentrations varied dramatically with location. The highest concentrations of the principal VOC contaminants were found in the service line, low VOC concentrations were found in the adjacent water main and product water from the treatment plant sample had undetectable contamination (Figure 1). Contaminants were conceivably drawn into the water main from service line sources because of the high-water demand during the fire initially and slowly thereafter. Elevated contamination persisting many weeks or months after the fire confirm that sorbed VOCs continue to be dispersed over time[3].

Information Obtained from Burning Plastic Pipes in the Laboratory.

Glue Solvents.—Our initial attempts to identify sources of fire-related contaminants focused on laboratory studies of plastic plumbing materials. We investigated several variables during combustion of PVC pipes including contamination from glued pipe sections, influence of different heat sources and impacts of residual chlorine (Tables S-3). The principal VOCs determined after soaking an unheated, control pipe section in water were primer and glue solvents (Figure 2), especially THF and MEK. Heating or charring glued PVC pipes resulted in swelling of the glued joint and mobilization of these solvents. The high concentrations of these solvents found are probably not representative of those found in typical applications where fire damage is not a factor except possibly in new construction or after recent pipe repairs. However, THF was reported by other researchers investigating drinking water after the Camp Fire. [11] Glued PVC pipes are well flushed with water after installation substantially depleting them as a long-term source. [11,25]

Pyrolysis Temperature.—The relatively low concentrations of benzene released from the flame-treated PVC in our laboratory experiments suggested that the experimental temperatures -- only 150°C for PVC -- were inadequate to substantially degrade the PVC polymer. Polyethylene pipes, both PEX and HDPE, by comparison ignited in our laboratory simulations resulting in surface temperatures as high as 400°C. Polyethylene pipe combustion products were primarily low-molecular-weight olefins from PEX while HDPE transformation products also included aldehydes and ketones (Tables S-4 and S-5). Benzene and naphthalene also were among the combustion products. In total, more than 24 VOCs were leached from charred PEX pipes in 100 hr. More than 32 VOC transformation products of HDPE appeared after 72 hr.

The laboratory simulations were qualitative as heating of plastic samples took place in an open hood. A large fraction of volatile products may have escaped prior to immersion of heated pipes in water and thus product yields and mass balances cannot be estimated. In addition, experiments were not controlled as to oxygen levels, temperatures or duration of heating.

During pyrolysis, PVC and other halogenated plastics undergo a first-stage evolution of HCl followed by a second stage evolving additional HCl accompanied by aromatic and aliphatic hydrocarbons. Aracil et al.[7] have demonstrated that the pyrolysis and combustion of PVC and the distribution of products is controlled by temperature and oxygen. In their studies at 500°C, complex mixtures of VOCs and SVOCs are produced in oxygenated conditions – at higher temperatures most contaminants undergo complete oxidation. At the temperatures in the current PVC lab experiments, Phase I pyrolysis products begin to appear while the Phase II reactions, including aromatization and aromatic hydrocarbon production, are not yet prominent.

Wildfire temperatures are influenced by many variables including type and quantity of fuel, humidity, height above ground and velocity. Fire temperatures in shrublands and aspen forests are about 368 to 445°C.[26] Yet soil temperatures more than 5 – 10 cm below the surface, where water lines may be buried, may barely exceed ambient temperatures.[27] The quantity of fuel influences fire temperatures and bare mineral soil dissipates heat effectively.[26]

Chlorine Reactions.—Polyethylene combustion products reacted rapidly with chlorine at chlorine experimental concentrations of 2.5 mg/L with substantial reaction taking place after 96 hours (Figure 3). Consumption of olefin transformation products was accompanied by the appearance of probable disinfection by-products (DBP). DBP were more prominent in water extracts of charred PEX pipes. Supplemental treatment with chlorine yielded some chloroform as a DBP (e.g., 46 μg/L in the control) and chloroform found was increased when the PVC had been heated with the heat gun (e.g., 67–68 μg/L), but chloroform concentrations were lower for pipes exposed to flame (e.g., 27 and 3.7 μg/L) (Table S-3).

The laboratory data indicate that the typical chlorine residual in drinking water distribution systems (0.5 ppm) is adequate to modify the combustion product distribution observed after fires. The contact times in the lab were 4 days or less. The contact times in the drinking water distribution system after the Camp Fire are difficult to estimate as there were periods of dewatering and two flush/stagnate/test cycles that preceded sample collection – the estimated contact time was 2 – 4 weeks total. In this time frame unsaturated or other easily-oxidized polyethylene combustion products would have been largely consumed.

Understanding Sources based on Combustion Literature.

Our laboratory experiments did not provide a large number of combustion products for use as probes. In total we identified 29 compounds associated with PVC, HDPE and PEX combustion (Tables 1 and 2, last 3 columns). However, we utilized the substantial literature on the incineration of plastics as a further aid in interpretation. This information also provided a means to consider alternate sources such as burning biomass, building materials and other fuels which relate to the intrusion of smoke.[4]

Many of the combustion products including benzene and the common VOCs (e.g., BTEX) have multiple sources. Benzene, for example, is a combustion product of PVC, PEX, and HDPE as well as burning of biomass, tires/liquid fuel, household wastes, landfill, pesticide bags, automobile shredder waste, fiberglass and fabrics (Tables 1 and 2). As such, benzene is not a specific marker of the burning of any particular material.

Among the 95 organic contaminants found in the service line, thirty-two are PVC combustion products and twenty-eight are also combustion products of PE plastics including PEX and HDPE. PVC and PE have many combustion products in common, e.g., twenty-five service line contaminants. Only nine of the chemicals found in the Camp Fire service line sample appear to be specific to combustion of these two plastics: ethenylmethylbenzene (*o*, *m* and *p* isomers), α-methylstyrene, propene, 1-ethyl-3-methylbenzene, 1,3-pentadiene, prop-1-ynylbenzene and fluoren-9-one.

Some plastic combustion products were not detected in the service line including “specific” pyrolysis products from PVC (e.g., 2-ethyl-1-hexanol, isobutyl methacrylate, 2-ethylhexyl acetate and 2-ethylhexanal). The same was true for some “specific” HDPE and PEX combustion products, (e.g., 2-methyl-1-propene, 1-hexene, ethyl cyclopropane, pentane, 1-heptene, octanal, pentanal, decanal and 2-decanone) – these products may have been absent due to chlorine reactivity. In contrast, certain non-specific probes, particularly benzene, were found in the service line at much higher relative concentrations than in laboratory simulations. Why benzene is so prominent deserves further investigation.

Because of the high number of plastic combustion products found, it is likely that fire damage to plastic service lines and other residential plastic materials contributed to contamination observed in the water system. Investigators found physical damage to plastic pipes and water meters at both the Camp Fire and earlier Tubbs Fire.[3] PVC irrigation systems also reportedly melted at many homes with potential backflow of combustion products into the system.

Fifty-five organic compounds found in the affected service line are associated with burning biomass, building materials and wastes. Twenty-three of these compounds were not associated with burning PVC or PE plastics: benzonitrile, 2-methy-1-benzofuran, 2-

methylbenzonitrile, 1-benzothiophene, 7-methylbenzofuran, 2-methyl-1H-indene, thiophene, naphthalene-2-carbonitrile, 3-ethylbenzonitrile, 2-methylphenol, 4-methylbenzaldehyde, naphthalene-2-carbonitrile, 2-methylfuran, quinoline, 4-methylbenzonitrile, chlorobenzene, (3-methylphenyl) acetate, 2-methylthiophene, 2,4-dimethylphenol, 1-(4-methylphenyl) ethanone, (4-methylphenyl) acetate, dibenzofuran, and 2,5-dimethylbenzaldehyde.

The known sources of these compounds are varied, e.g., 2-methylfuran, methylbenzofurans, 1-(4-methylphenyl) ethanone, (3-methylphenyl) acetate, (4-methylphenyl) acetate, naphthalenecarbonitriles are produced by burning biomass (e.g., forest fires, grasses, lumber, agricultural wastes). Sulfur compounds (e.g., thiophene, methylthiophene, benzo[b]thiophene) are reported combustion products from burning tires. Notably, some reported wood combustion products (e.g., methoxyphenols) were not detected among the service line contaminants. A more extensive set of biomass combustion products is needed to better understand the importance of intrusion of airborne combustion products.

CONCLUSIONS

Drinking water systems damaged by wildfire are vulnerable to contamination by benzene and a complex mixture of organic contaminants that require substantial cost and time to remediate. The present study provides a detailed analysis of these contaminants in one highly-contaminated service line sample from the 2018 Camp Fire. Thirty-two compounds associated with burning of PVC and twenty-eight transformation products associated with burning of polyethylene plastics were found. This sample also contained twenty-three organic compounds associated with biomass burning or open, uncontrolled burning of waste materials, but not burning of plastic pipes *per se*. The findings support hypotheses that drinking water infrastructure is contaminated with low-molecular-weight organic compounds by multiple mechanisms including fire damage to plastics and intrusion of airborne combustion products. Laboratory simulations demonstrate that residual chlorine consumes some plastic transformation products and may modify the contaminant profile observed.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Synopsis:

Comprehensive analysis of organic contaminants in fire-damaged drinking water service lines informs our understanding of contamination sources and mechanisms.

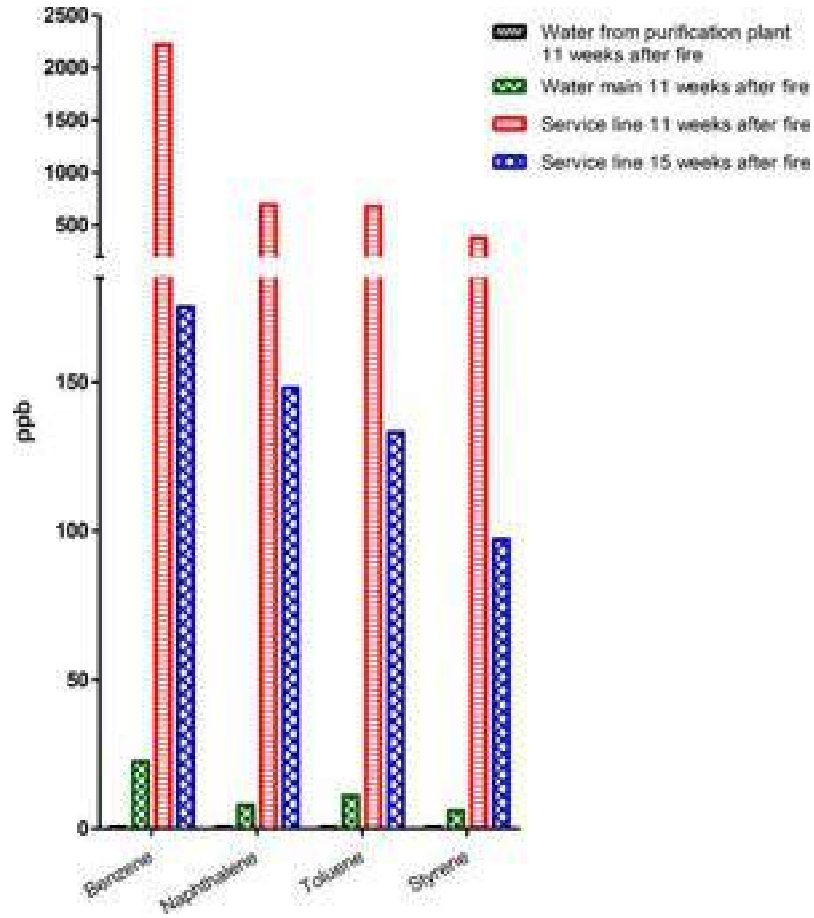

Figure 1.
Profiles of VOC contaminants in additional water system locations and samples from the Camp Fire.

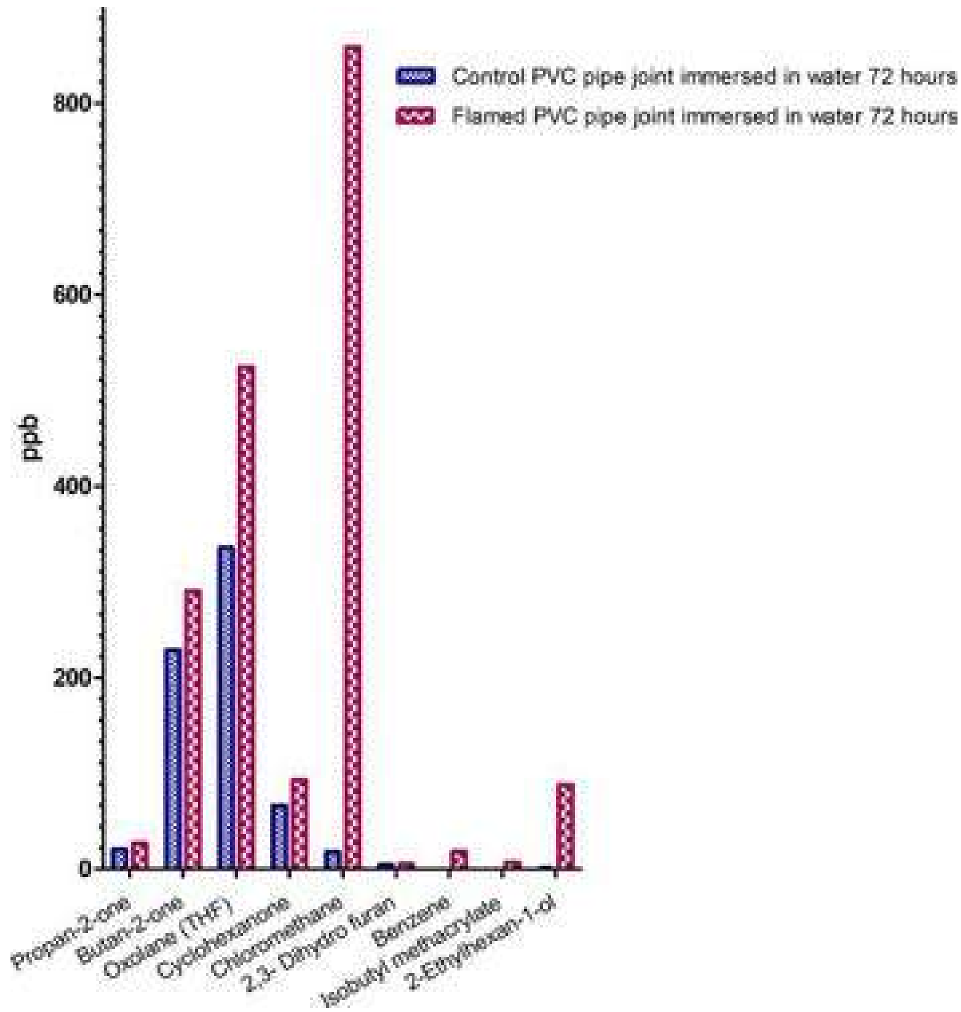

Figure 2.

Mobilization of primer and glue solvents from and thermal decomposition products of PVC polymeric pipes.

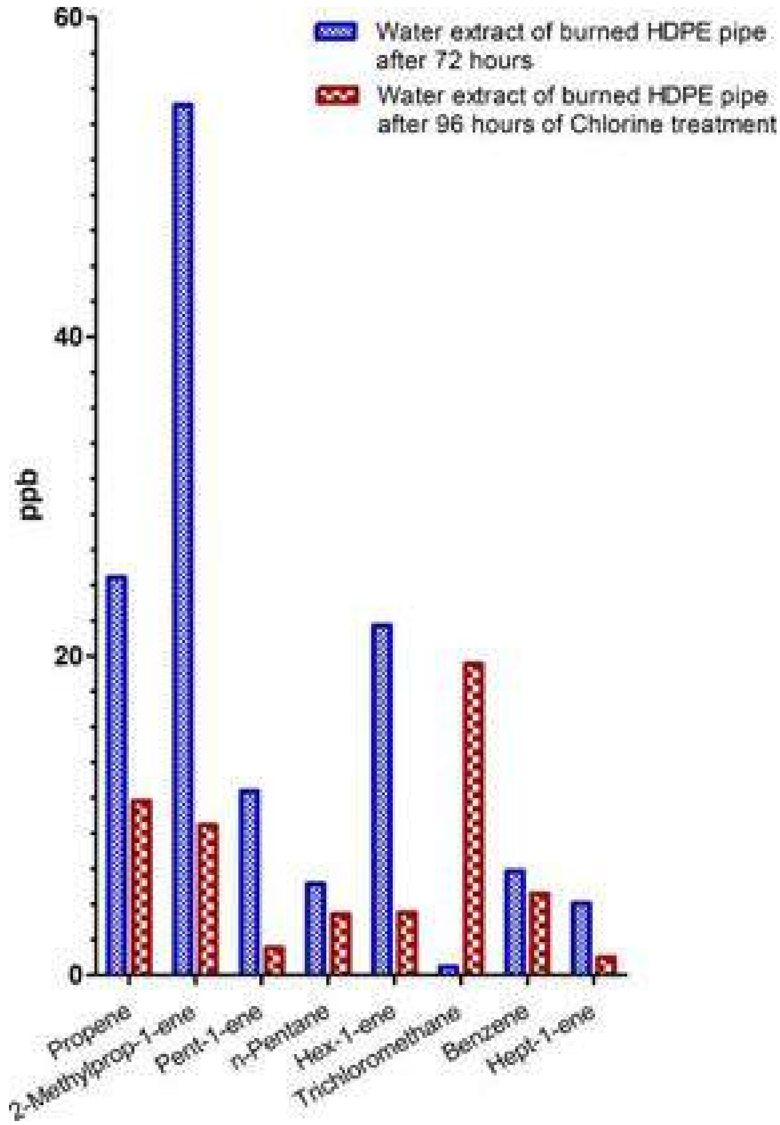

Figure 3.
Chlorine reactions with HDPE combustion products.

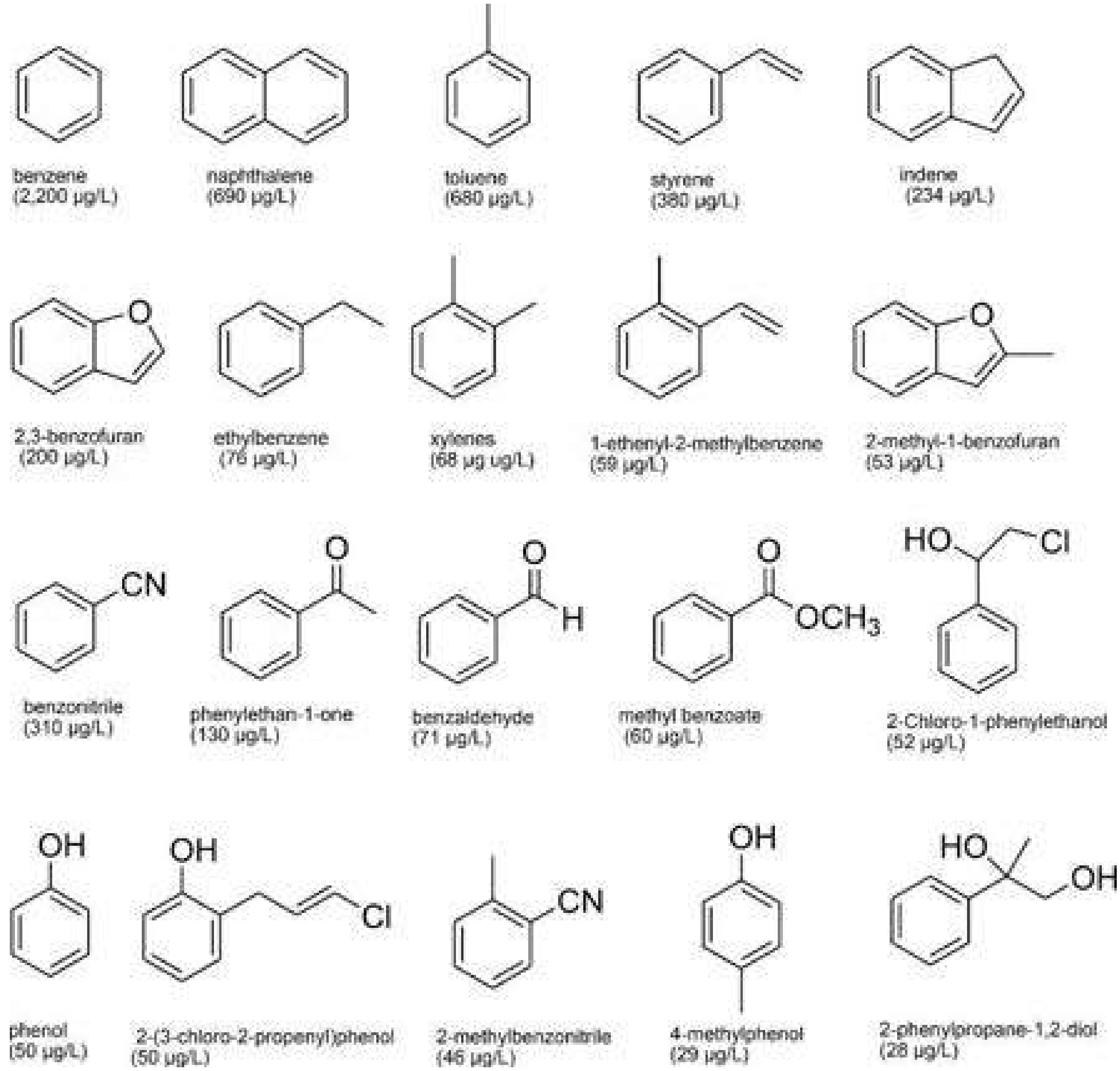

Figure 4.
VOCs and SVOCs detected in the service line water sample from the 2018 Camp Fire.

Table 1.

VOCs Determined in Service Line Water Sample from Wildfire-Impacted Community and Potential Sources.

				Associated Based on Lab Simulations (Current Work)		
Con. (μ/L)	Identified Compound	CAS No.	Associated Based on Literature	PVC	PEX	HDPE
2200	Benzene **	71-43-2	HDPE,PE,PE*,PEX,PVC,PVC*; AB,BB,CB,DB,EB	PVC	PEX	HDPE
690	Naphthalene **	91-20-3	HDPE,PE*,PVC*; AB,BB,CB,DB,EB	PVC	PEX	HDPE
680	Toluene **	108-88-3	HDPE,PE*,PEX,PVC,PVC*,other; AB,BB,CB,DB,EB		PEX	HDPE
380	Styrene **	100-42-5	CPVC,HDPE,PE*,PVC,PVC*,other; AB,BB,CB,DB,EB	PVC	PEX	HDPE
230	Indene	95-13-6	PE*,PVC*; CB	PVC		
200	2,3-Benzofuran	271-89-6	PVC*; BB,CB			
76	Ethylbenzene **	100-41-4	HDPE,PE*,PVC,PVC*,other; AB,BB,CB,DB,EB	PVC	PEX	HDPE
59	1-Ethenyl-2-methylbenzene; or isomer	611-15-4	PE*,PVC*			
52	2-Methyl-1-benzofuran; or isomer	4265-25-2	DB			
48	Benzonitrile	100-47-0	BB,CB			
40	1,4-Xylene/1,3-Xylene **	106-42-3;108-38-3	PE*,PEX,PVC,PVC*; AB,BB,CB,DB,EB		PEX	HDPE
37	Ethynylbenzene	536-74-3	PE*,PVC*; CB		PEX	HDPE
32	2-Methylnaphthalene	91-57-6	PE*,PVC*; BB,CB,DB,EB			HDPE
31	Isopropenylbenzene (α-Methylstyrene)	98-83-9	PE*,PVC*,other	PVC	PEX	
30	1,1′-Biphenyl	92-52-4	PE*,PVC*; AB,BB,CB,EB	PVC		
28	(2E)-3-Phenylprop-2-enal (Cinnamaldehyde); or isomer	104-55-2				
28	1,2-Xylene **	95-47-6	PEX,PVC,PVC*; AB,BB,CB,DB,EB			
28	1-Benzothiophene (3,3,5-Trimethylcyclohexyl) 2-	95-15-8	CB			
25	methylpro-2-enoate	7779-31-9				
24	Methyl benzoate	93-58-3				
24	Trichloromethane (Chloroform) **	67-66-3	CPVC,PVC; AB,EB	PVC	PEX	HDPE
24	1-Methylnaphthalene	90-12-0	PE*,PVC*; CB			HDPE
23	Benzaldehyde	100-52-7	PE,PE*,PVC,PVC*,other; BB,CB,DB,EB	PVC		
22	7-Methylbenzofuran; or isomer	17059-52-8	DB			
18	2-Methyl-1H-indene; or isomer	2177-47-1	CB			
16	Thiophene	110-02-1	CB			
16	1-Methyl-1H-indene; or isomer	767-59-9	PE*,PVC*; BB			
15	Propene	115-07-1	PE*,PVC*,other		PEX	HDPE
12	Acetophenone	98-86-2	HDPE,PE,PEX,PVC*,other; AB,DB,EB			
12	1-Methylcyclopropene	3100-04-7				

11	1-Ethyl-3-methylbenzene; or isomer	620-14-4	PE,PE*, PVC,PVC*			
10	1-Ethyl-2-methylbenzene; or isomer	611-14-3	PE*,PVC*; BB,CB,EB			
9.0	Chloromethane**	74-87-3	AB,BB,DB,EB	PVC		
9.0	Acenaphthylene	208-96-8	PE*,PVC*; BB,CB,DB,EB		PEX	HDPE
8.0	Azulene	275-51-4				
8.0	1-Ethenyl-3-methylbenzene; or isomer	100-80-1	HDPE,PE*,PVC,PVC*			
7.0	[(1E)-Buta-1,3-dienyl]benzene; or isomer	1515-78-2				
6.0	2-Methylfuran	534-22-5	BB			
6.0	1-Ethenyl-4-methylbenzene; or isomer	622-97-9	HDPE,PE*;			
<5	1,1′-Methylenedibenzene (Diphenylmethane)	101-81-5				
<5	Acetaldehyde	75-07-0	PE; AB,BB,CB,DB,EB			
<5	Furan	110-00-9	Other; BB			
<5	1,3-Pentadiene	504-60-9			PEX	HDPE
<5	2-Methylthiophene	554-14-3	CB			
<5	3-Methylthiophene	616-44-4				
<5	Chlorobenzene	108-90-7	AB,EB			
<5	(Propan-2-yl)benzene (Cumene); or isomer	98-82-8	PE; AB,CB,EB			
<5	Prop-2-enyl)benzene (Allylbenzene)	300-57-2	PE*,PVC*; CB			
<5	Propylbenzene	103-65-1	PE,PE*, PVC,PVC*; CB			
<5	1,3,5-Trimethylbenzene (Mesitylene); or isomer	108-67-8	PE*,PVC*; BB,CB,EB			
<5	2,3-Dihydro-1H-indane (Indane)	496-11-7	PE*; CB	PVC		
<5	Prop-1-ynylbenzene	673-32-5	PVC*			
<5	4-Methylbenzaldehyde; or isomer	104-87-0	CB,DB			
<5	2-2-Methylbenzonitrile; or isomer	529-19-1	EB			

** Identified using authentic standard

Chlorinated polyvinyl chloride (CPVC): CPVC leachate, **HDPE:** HDPE leachate, **Polyethylene (PE):** PE leachate, **PE*:** from pyrolysis of PE, **PEX:** PEX leachate, **Polypropylene (PP):** PP leachate, **PVC:** PVC leachate, **PVC*:** from pyrolysis of PVC, **Other:** from other materials used in water distribution systems

AB: HAP (hazardous air pollutant) from open burning, **BB:** open burning of biomass, **CB:** open burning of scrap tires, liquid fuel, **DB:** open burning of household waste, landfill, pesticide bags, **EB:** Open burning of automobile shredder residue, fiberglass, fabric

Table 2.

SVOCs Determined in Service Line Water Sample from Wildfire-Impacted Community and Potential Sources

				Associated Based on Lab Simulations (Current Work)		
Con. (μg/L)[1]	Identified Compound[2]	CAS No.	Associated Based on Literature	PVC	PEX	HDPE
310	Benzonitrile	100-47-0	BB,CB			
130	Acetophenone	98-86-2	HDPE,PE,PEX,PVC*,other; AB,DB,EB			
100	Naphthalene	91-20-3	HDPE,PE*,PVC*; AB,BB,CB,DB,EB	PVC	PEX	HDPE
71	Benzaldehyde	100-52-7	PE,PE*,PVC,PVC*,other; BB,CB,DB,EB	PVC		
60	Methyl benzoate	93-58-3				
52	2-Chloro-1-phenylethanol	1674-30-2				
50	Phenol	108-95-2	PVC*,other; AB,BB,CB,DB,EB			
50	2-(3-Chloro-2-propenyl)-phenol; or isomer	86694-60 2				
46	2-Methybenzonitrile; or isomer	529-19-1	EB			
32	2-(3-Chloro-2-propenyl)-phenol; or isomer	86694 60-2				
29	4-Methylphenol	106-44-5	PEX; AB,DB,EB			
28	2-Phenylpropane-1,2-diol	4217-66-7				
18	2,3-Benzofuran	271-89-6	PVC*; BB,CB			
18	1*H*-Indene	95-13-6	PE*,PVC*; CB	PVC		
18	1,1′-Biphenyl	92-52-4	PE*,PVC*; AB,BB,CB,EB	PVC		
17	(E)-4-Phenylbut-3-ene-2-one	122-57-6				
15	Naphthalene-2-carbonitrile	613-46-7	BB			
14	Styrene	100-42-5	CPVC,HDPE,PE*, PVC,PVC*,Other; AB,BB,CB,DB,EB	PVC	PEX	HDPE
13	Phenyl acetate	122-79-2				
11	Diphenylmethanone (Benzophenone)	119-61-9				
10	Acenaphthylene	208-96-8	PE*,PVC*; BB,CB,DB,EB		PEX	HDPE
10	2-Methylphenol; or isomer	95-48-7	AB,BB,DB,EB			
10	beta-Hydroxy-4-Methylbenzenepropanenitrile	997097-18-2				
10	3-Ethylbenzonitrile; or isomer	34136-57 7	EB			
8.0	1-Phenylpropan-1-one	93-55-0				
8.0	4-Methylbenzaldehyde; or isomer	104-87-0	CB,DB			
8.0	1-Benzothiophene	95-15-8	CB			
8.0	Naphthalene-1-carbonitrile	86-53-3	BB			
8.0	Fluoren-9-one	486-25-9	PVC*			
6.0	2,4,6-Trichlorophenol	88-06-2	Other; AB,DB			
6.0	Naphthalene-2-carbaldehyde	66-99-9	PVC*; EB			

				Associated Based on Lab Simulations (Current Work)		
6.0	Quinoline	91-22-5	AB			
6.0	4-Ethenylbenzonitrile; or isomer	3435-51-6				
5.0	Dodecyl prop-2-enolate (Dodecyl acrylate)	2156-97-0				
5.0	4-Methylbenzonitrile	104-85-8	EB			
5.0	(3-Methylphenyl) acetate	122-46-3	BB			
4.0	1-Methylnaphthalene	90-12-0	PE*,PVC*; CB			HDPE
4.0	2,4-Dimethyphenol; or isomer	105-67-9	BB, DB			
4.0	2-Methylnaphthalene	91-57-6	PE*,PVC*; BB,CB,DB,EB			HDPE
3.0	2-Methyl-1-benzofuran	4265-25-2	DB			
3.0	1-(4-Methylphenyl) ethanone	122-00-9	BB			
3.0	Ethylbenzene	100-41-4	HDPE,PE*,PVC,PVC*,other; AB,BB,CB,DB,EB	PVC	PEX	HDPE
3.0	Naphthalen-1-yl acetate	830-81-9				
3.0	3-Phenylpyridine	1008-88-4				
2.0	Benzo[c]cinnoline	230-17-1				
2.0	Ethynylbenzene	536-74-3	PE*,PVC*; CB		PEX	HDPE
2.0	(4-Methylphenyl) acetate	140-39-6	BB			
2.0	7-Methyl-1-benzofuran	17059-52 8	DB			
2.0	Methyl 3-methylbenzoate; or isomer	99-36-5				
2.0	Phenyl propanoate	637-27-4				
2.0	9*H*-Fluorene	86-73-7	PE*,PVC*; BB,CB,DB,EB			
1.0	Naphthalen-2-yl acetate	1523-11-1				
1.0	1,4-Xylene/1,3-Xylene	106-42-3;108-38-3	PE*,PEX,PVC, PVC*; AB,BB,CB,DB,EB		PEX	HDPE
1.0	2,5-Dimethylbenzaldehyde	5779-94-2	CB			
1.0	Benzo[f]isoquinoline; or isomer	229-67-4				
1.0	Phenanthrene	85-01-8	PE*,PVC*; BB,CB,DB,EB			
<1	1-Methyl-1*H*-indene; or isomer	767-59-9	PE*,PVC*; BB			
<1	(3,3,5-Trimethylcyclohexyl) 2-methylpro-2-enoate	7779-31-9				
<1	3,5-Di-tert-butyl-2-hydroxybenzaldehyde	37942-07-7				
<1	[1,1′-Biphenyl]-2-carbonitrile	24973-49 7				
<1	Dibenzofuran	132-64-9	AB,BB,DB,EB			

CPVC: CPVC leachate, HDPE: HDPE leachate, PE: PE leachate, PE*: from pyrolysis of PE, PEX: PEX leachate, PP: PP leachate, PVC: PVC leachate, PVC*: from pyrolysis of PVC, Other: from other materials used in water distribution systems

AB: HAP (hazardous air pollutant) from open burning, BB: open burning of biomass, CB: open burning of scrap tires, liquid fuel, DB: open burning of household waste, landfill, pesticide bags, EB: Open burning of automobile shredder residue, fiberglass, fabric

EXHIBIT I

FORBES > BUSINESS

BREAKING

‘There’s No Water Coming Out Of The Fire Hydrants': Billionaire Caruso Becomes Top L.A. Fires Critic

Derek Saul Forbes Staff

Derek Saul has covered markets for the Forbes news team since 2021.

Follow

3

Jan 8, 2025, 04:31pm EST

Updated Jan 8, 2025, 04:31pm EST

TOPLINE Amid a flurry of largely right-wing backlash of California public officials’ handling of the deadly wildfires near Los Angeles, the billionaire Rick Caruso, who unsuccessfully ran as a Democrat for Los Angeles mayor, emerged as the most notable critic, tearing into his former opponent in L.A. Mayor Karen Bass and earning the support of the world’s richest man and GOP megadonor Elon Musk.

Billionaire Rick Caruso appears at a campaign event in 2022.

LOS ANGELES TIMES VIA GETTY IMAGES

KEY FACTS

- A clip of Caruso calling into the Fox 11 Los Angeles television station late Tuesday went viral for Caruso's pointed criticism of Bass and what he assessed as the city's and county's lack of preparation for the wildfires.

- Caruso went after Bass for going on a planned diplomatic trip to Ghana, lamenting "we've got a mayor that's out of the country, and we've got a city that's burning" – Bass was en route to California on Wednesday, according to local news outlet KTLA, less than 24 hours after the fire ignited at about 10:30 a.m. PST in the Pacific Palisades.

- In the same interview, Caruso tore down the logistics of the region's fire prevention and fighting resources, saying "there's no water coming out of the fire hydrants" due to what he claimed was an inadequately filled reservoir and overall "absolute mismanagement" of the city's firefighting infrastructure, which Caruso likened to that of a "third-world country."

- Caruso chalked up the "failure" to "basic stuff," including allegedly failing to remove the brush from hills overlooking the metropolis, which he claimed was the root cause of the severe outbreak of the fires amid dry, high-wind conditions.

- Caruso, whose criticism differed from the likes of President-elect Donald Trump, who swiped at California Gov. Gavin Newsom for not greenlighting a fictitious "water restoration declaration," led a band of local politicians critical of the city, including Traci Park, the city council member representing the neighborhoods worst hit by the fires, who told the Los Angeles Times she has "more questions than answers" on how what she called the "chronic under-investment" in infrastructure contributed to the fire's severity.

- *See more of Forbes' coverage on the Southern California wildfires here and here.*

CONTRA

Los Angeles city officials addressed concerns about the fire hydrants at a Wednesday press conference. "A fire fight with multiple fire hydrants drawing water from the system for several hours is unsustainable," Mark Fitzgerald, director of the county's department of public works, told reporters, adding the high winds and low air visibility complicated the air delivery system of additional water. The county's three million-gallon water tanks all ran out by 3 a.m. PST on Wednesday, added Janisse Quiñones, the chief executive of the Los Angeles Department of Water and Power.

KEY BACKGROUND

The shopping center empire at the heart of Caruso's multibillion-dollar fortune was in the path of the wildfires, and Caruso told the Los Angeles Times there was damage to his Palisades Village development, one of the U.S.' 15 biggest shopping centers by sales per square foot. Caruso said to the newspaper he evacuated his home Tuesday, while his daughter's home was lost to the fire. Caruso lost to Bass in a 2022 runoff election for the mayorship, running as a more centrist candidate compared to Bass, who was a member of the Congressional Progressive Caucus during her time in Congress. Caruso was a registered Republican until 2019.

CRUCIAL QUOTE

Patrick Soon-Shiong, the billionaire owner of the Los Angeles Times, added to the criticism of the city's wildfires response. "Fires in LA are sadly no surprise, yet the Mayor cut LA Fire Department's budget by $23M. And reports of empty fire hydrants raise serious questions. Competence matters...," Soon-Shiong wrote on social media Wednesday. The billionaire appeared to refer to Bass' $22.9 million proposed cut to the city fire department's more than $800 million budget for the ongoing fiscal year.

WHAT HAS MUSK SAID ABOUT CARUSO AND THE FIRES?

Caruso is one of the few Democratic politicians to earn praise from Musk. Caruso is "extremely competent" compared to the "utterly incompetent" Bass, Musk bemoaned in a Wednesday post to his X social media network resharing Caruso's appearance on Fox 11. Musk endorsed Caruso in his unsuccessful Democratic bid for Los Angeles mayor, support which notably came as Musk grew increasingly embedded in GOP politics. Musk's $44 billion purchase of Twitter closed four months later, around the same time he supported voting Republican in the 2022 midterm elections.

FORBES VALUATIONS

Musk's $416 billion net worth is about $180 billion more than that of the next-richest human, Amazon founder Jeff Bezos. Caruso's comparatively small $5.8 billion fortune makes him the 556th-wealthiest person in the world, according to our calculations. Caruso is one of the richest people to ever run for public office (Trump is worth $6 billion for comparison). Caruso's billions stem from his Los Angeles area real estate dealings, while Musk's come from his stakes in the several billion-dollar companies he leads, namely Tesla and SpaceX. Soon-Shiong is worth $5.7 billion, the

571st-largest fortune in the world stemming from the medical doctor's development of the cancer drug Abraxane.

FURTHER READING

FORBES

California Wildfire Live Updates: Palisades Fire In L.A. Grows To Nearly 12,000 Acres

By Antonio Pequeño IV

FORBES

Trump Slams Gavin Newsom For Wildfires—Falsely Claiming He Rejected 'Water Restoration Declaration'

By Sara Dorn

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Derek Saul

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Derek Saul is a New Jersey-based Senior Reporter on Forbes' news team. He graduated in 2021 from Duke University, where he majored in Economics and served... **Read More**

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TS **Tom S**

8 January, 2025

Mr. Caruso was asked to respond to the following before the mayoral election:

"Fires in the city and its surroundings are growing more frequent and more severe as a result of the climate crisis. What is the most important and impactful step the city can take as part of a strategy to tackle this prob...

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RL **Rylan L**

9 January, 2025

This article highlights a critical issue—public safety and infrastructure go hand in hand. It's alarming to see gaps like this in such a vital system. Addressing such challenges requires strategic planning and legal insight. Legally Mine Reviews offers valuable perspectives on navigating complex le...

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TK **Timothy K**

17 January, 2025

Here we go again with Caruso (AKA Trumps sidekick) providing disinformation to the public about the fires. All lies. Nobody should listen to his lies and the fact that he brought his own crew and water and did NOTHING to help any surrounding businesses and homes shows what a selfish and privileged ...

See more

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EXHIBIT J

Unsafe Water Alert
January 10, 2025

Por favor lea el anuncio en Espanol abajo

Los Angeles Department of Water & Power

DO NOT DRINK THE TAP WATER IN PACIFIC PALISADES, ZIP CODE 90272, and ADJACENT COMMUNITIES IN THE LADWP SERVICE AREA NORTH OF SAN VICENTE BLVD.

Failure to follow this advisory could result in illness.

The Los Angeles Department of Water & Power (LADWP) and State Water Resources Control Board Division of Drinking Water strongly advise consumers in the 90272 zip code, and adjacent communities in the LADWP service area north of San Vicente Boulevard to **NOT DRINK OR COOK WITH THE TAP WATER UNTIL FURTHER NOTICE.**

This Notice updates the Boil Water Notice issued on January 8, 2025.

This notice is due to the potential of fire-related contaminants, including benzene and other volatile organic compounds (VOCs) that may have entered the water system. As a precaution, LADWP is providing this **DO NOT DRINK NOTICE**.

Due to VOCs ability to vaporize and become airborne, residents are advised to:

- **Limit use of hot water**
- **Limit shower time/bathing, and do not take hot baths (use lukewarm water and ventilate area)**
- **If using a dishwasher to wash dishes use the air-dry setting**
- **Wash clothing in cold water**
- **If the clothes dryer does not vent outside, avoid using it (dry laundry outdoors)**
- **Do not use hot tubs or swimming pools**
- **Use proper ventilation when using hot water indoors**

Follow these important instructions to ensure your health and safety:

- **DO NOT DRINK OR COOK WITH THE TAP WATER---USE ONLY BOTTLED WATER**
  Bottled water should be used for all drinking (including baby formula and juice), brushing teeth, washing dishes, making ice and food preparation **until further notice**. This also applies to pets and domestic animals.

- **DO NOT TREAT THE TAP WATER YOURSELF**
  Boiling, freezing, filtering, adding chlorine or other disinfectants, letting water stand, or applying any other form of treatment will NOT make the water safe.

The affected area includes consumers in zip code 90272 and adjacent communities in the LADWP service area north of San Vicente Boulevard.

LADWP is issuing this notice as of January 10, 2025. Until adequate water pressure can be re-established, required flushing of the distribution system can be performed, and water is tested and confirmed to be safe, this notice is in effect. It is possible that disease-causing organisms or other contaminants could be present. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches. If you experience any of these symptoms, please consult with your healthcare professional as soon as possible.

LADWP will inform you when tests show that water is safe to drink. The timing for resolving this is unknown dependent on evolving conditions, performance of necessary system flushing and testing in accordance with public safety protocols.

Please share this information with all other people who drink this water, especially those who may not have received this public notice directly such as people in apartments, nursing homes, schools, and businesses. You can do this by posting this notice in a public place or distributing copies by hand or mail.

If you have questions about other uses of tap water, please contact us at 1-800-DIAL DWP for 24-hour assistance. You may also contact the State Water Resources Control Board District Office at (818) 551-2004.

Thank you for your patience as we work to restore your water service and ensure the highest water quality.

# # #

BOTTLED WATER DISTRIBUTION LOCATIONS
for Customers Affected by Do Not Drink Notice
January 10, 2025

LADWP has issued a DO NOT DRINK NOTICE for Pacific Palisades Zip Code 90272, and Adjacent Communities in the LADWP Service Area North of San Vicente Blvd under evacuation orders due to the potential of fire-related contaminants that may have entered the water system in the area. Affected customers are urged to not drink or cook with the tap water until further notice.

LADWP will be distributing bottled water to affected customers at the following distribution locations:

- **Westwood Recreation Center, 1350 S Sepulveda Blvd, Los Angeles, CA 90025 (Open 24 hours in coordination with American Red Cross)**

- **Adjacent to the Brentwood Country Club, 741 S. Gretna Green Way, Los Angeles, CA 90049 (10 a.m. – 6 p.m.)**

LADWP staff will be present to distribute. For more information, contact 1-800-DIAL-DWP.

SITIOS DE DISTRIBUCION DE AGUA EMBOTELLADA
Para Clientes Afectados por Aviso de No Beber
10 de enero, 2025

LADWP ha publicado un **AVISO DE NO BEBER** que reemplaza el previo “Aviso para Hervir Agua” para clientes en el área de **Pacific Palisades (código postal 90272) y comunidades cercanas en el área se servicio de LADWP al norte de San Vicente Blvd** bajo órdenes de evacuación debido al potencial de que contaminantes relacionados al incendio podrían haber entrado al sistema de agua. Se le urge a clientes afectados NO beber ni cocinar con agua de la llave hasta nuevo aviso.

LADWP distribuirá agua embotellada a los clientes afectados en los siguientes sitios de distribución:

- **Westwood Recreation Center, 1350 S. Sepulveda Blvd., Los Angeles, CA 90025 (las 24 hours en coordinación con la Cruz Roja)**

- **Adyacente a Brentwood Country Club, 741 S. Gretna Green Way, Los Angeles, CA 90049 (10 a.m. – 6 p.m.)**

Equipos de LADWP estarán presente para distribuir. Para obtener más información, llame a 1-800-DIAL-DWP.

Alerta de agua
10 de enero de 2025

Los Angeles Department of Water & Power

NO BEBA EL AGUA DE LA LLAVE EN PACIFIC PALISADES, CÓDIGO POSTAL 90272, y COMUNIDADES ADYACENTES EN EL ÁREA DE SERVICIO DE LADWP AL NORTE DE SAN VICENTE BLVD.

Falta de cumplir con este aviso podría resultar en una enfermedad.

El Departamento de Agua y Energía de Los Ángeles (LADWP, por sus siglas en inglés) y la División de Agua Potable de la Junta Estatal de Control de Recursos de Agua recomiendan enfáticamente a los consumidores en el código postal 90272 y a las comunidades adyacentes en el área de servicio del LADWP al norte de San Vicente Boulevard que **NO BEBAN NI COCINEN CON EL AGUA DE LA LLAVE HASTA NUEVO AVISO.**

Este Aviso actualiza el Aviso de Hervir el Agua emitido el 8 de enero de 2025.

Este aviso se emite debido a la posible presencia de contaminantes relacionados con el incendio, incluido el benceno y otros compuestos orgánicos volátiles (COV) que pueden haber ingresado al sistema de agua. Como medida de precaución, el LADWP está emitiendo este **AVISO DE NO BEBER.**

Debido a la capacidad de los COV de vaporizarse y dispersarse en el aire, se recomienda a los residentes que:

- **Limite el uso de agua caliente.**
- **Limite el tiempo de ducha/baño, y no tome baños calientes (utilice agua tibia y ventile el área)**
- **Si usa una lavadora de platos, use la configuración de secado al aire**
- **Lave la ropa con agua fría**
- **Si la secadora de ropa no ventila al exterior, evite usarla (seque la ropa al aire libre)**
- **No utilice jacuzzis ni piscinas**
- **Use una ventilación adecuada cuando use agua caliente en interiores**

Siga estas instrucciones importantes para garantizar su salud y seguridad:

- **NO BEBA NI COCINE CON EL AGUA DE LA LLAVE--- USE SOLO AGUA EMBOTELLADA**
  El agua embotellada debe usarse para beber (incluyendo la preparación de fórmula para bebés y jugo), cepillarse los dientes, lavar los platos, hacer hielo y preparar alimentos **hasta nuevo aviso**. Esto también aplica a las mascotas y a los animales domésticos.

- **NO TRATE EL AGUA DE LA LLAVE POR SU CUENTA**
  Hervir, congelar, filtrar, añadir cloro u otros desinfectantes, dejar reposar el agua o aplicar cualquier otra forma de tratamiento NO hará que el agua sea segura.

El área afectada incluye a los consumidores en el código postal 90272 y las comunidades adyacentes en el área de servicio de LADWP al norte de San Vicente Boulevard.

LADWP emite este aviso a partir del 10 de enero de 2025. Hasta que se pueda restablecer una presión de agua adecuada, se pueda realizar el lavado requerido del sistema de distribución y se pruebe y confirme que el agua es segura, este aviso está en vigor. Es posible que estén presentes organismos que causan enfermedades u otros contaminantes. Estos organismos incluyen bacterias, virus y parásitos, los cuales pueden provocar síntomas como náuseas, calambres, diarrea y dolores de cabezas asociados. Si experimenta alguno de estos síntomas, consulte con su profesional de la salud lo antes posible.

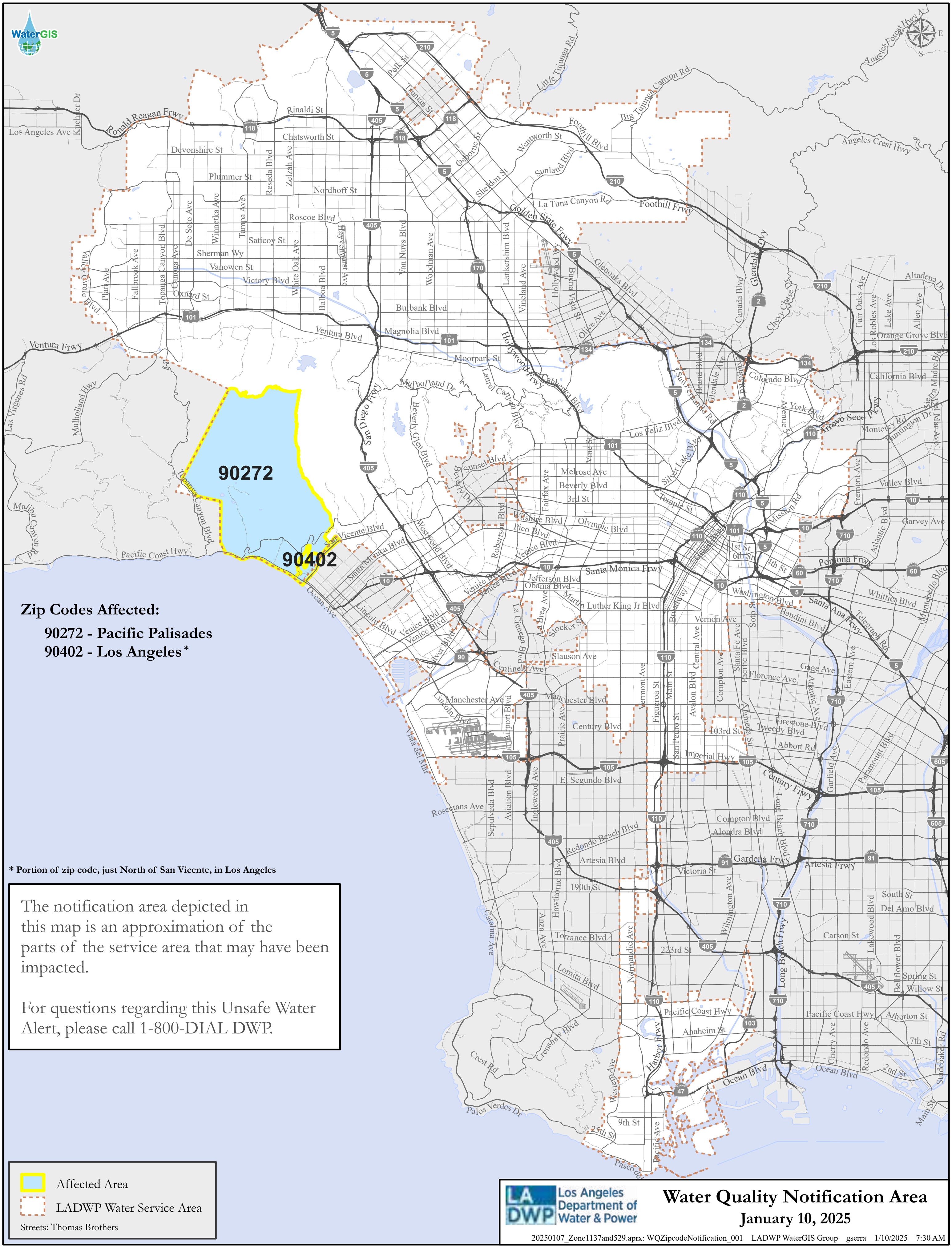
LADWP le informará cuando las pruebas demuestren que el agua es segura para beber. Se desconoce el tiempo necesario para resolver esta situación ya que depende de la evolución de las condiciones, el desempeño del lavado necesario del sistema y las pruebas realizadas de acuerdo con los protocolos de seguridad pública.

Por favor, comparta esta información con todas las personas que consumen esta agua, especialmente aquellas que no hayan recibido este aviso publico directamente, como residentes de apartamentos, hogares de ancianos, escuelas y negocios. Puede hacerlo colocando este aviso en un lugar público o distribuyendo copias a mano o por correo.

Si tiene preguntas sobre otros usos del agua de la llave, comuníquese al 1-800-DIAL DWP para asistencia las 24 horas. También puede contactar a la Junta Estatal de Control de Recursos de Agua al (818) 551-2004.

Gracias por su paciencia mientras trabajamos para restaurar su servicio y asegurarle la mas alta calidad de agua.

# # #



Water Quality Notification Area

January 10, 2025

Zip Codes Affected:

90272 - Pacific Palisades
90402 - Los Angeles*

*** Portion of zip code, just North of San Vicente, in Los Angeles**

The notification area depicted in this map is an approximation of the parts of the service area that may have been impacted.

For questions regarding this Unsafe Water Alert, please call 1-800-DIAL DWP.

20250107_Zone1137and529.aprx: WQZipcodeNotification_001 LADWP WaterGIS Group gserra 1/10/2025 7:30 AM

Do Not Drink Notice
Frequently Asked Questions (FAQs)

January 10, 2025

Q1 - Why was a Do Not Drink Notice issued for my water?

A Do Not Drink Notice was issued because structures in Pacific Palisades were destroyed by fire, and some areas in the water distribution system lost pressure. These conditions may have caused harmful contaminants, including benzene and other volatile organic chemicals (VOCs), to enter the water system. As a **precaution**, the State Water Resources Control Board, Los Angeles County Department of Public Health, and the Los Angeles Department of Water and Power are advising consumers in the affected area to NOT USE THE TAP WATER FOR DRINKING AND COOKING UNTIL FURTHER NOTICE.

Q2 – Is LADWP making bottled water available?

LADWP will be distributing bottled water to affected customers at two distribution locations: Westwood Recreation Center, 1350 S Sepulveda Blvd, Los Angeles, CA 90025 (starting at 8 am) and adjacent to the Brentwood Country Club, 741 S. Gretna Green Way, Los Angeles, CA 90049 (starting at 12 pm). LADWP staff will be present to pass out one (1) case of 24 bottles per household. For more information, contact 1-800-DIAL-DWP.

Q3 - How long will the Do Not Drink Notice be in effect?

LADWP will inform you when adequate water pressure can be re-established, and tests show that water is safe to drink. Expected timeframe for resolution is unknown and dependent on evolving fire, wind, and related conditions.

Q4 – Why was the Boil Water Notice changed to a Do Not Drink notice?

A Do Not Drink Notice is issued when a water system experiences wildfire impacts and may have fire related contamination. As a precautionary measure, this Notice is being issued until test data is available.

Because of the low pressure caused by the fire, our water may be contaminated with chemicals that cannot be removed by end users. When pressure drops very low, the system can suck in contaminants from burned structures and equipment and spread them through the system. Among such contaminants are benzene and other VOCs that cannot be removed by disinfectants such as bleach or by common household filter systems. Boiling contaminated water would vaporize those chemicals into the air you breathe.

Q5 – Can I treat the water myself?

No. Boiling, freezing, filtering, adding chlorine or other disinfectants, or letting water stand will not make the water safe.

Q6 - Should I limit hot water usage?

Yes, due to the VOCs ability to vaporize at lower temperatures and become airborne. Use proper ventilation when using water indoors.

Q7– Can I use tap water for drinking and cooking?

No. Use only bottled water or an alternate source of water.

Q8 - Is it safe to use bottled water?

It is safe to use bottled water. Bottled water should be used for all drinking (including baby formula and juice), brushing teeth, and making ice and food preparation.

Q9 - What container should I use to obtain water from another location?

The container you use to get water from an alternate source or temporary water station can greatly affect your water. Never use a container that has ever held a chemical, gasoline or other fuel. Use only clean containers that you know are fit and that are free of all dirt and contaminants.

Q10 - Can I use my water for cooking?

No, any water used for food preparation or cooking needs to come from bottled water or an alternate source.

Q11 - Can I use ice?

Yes, if made with bottled water. Do not use ice from automatic ice makers.

Q12 – Can I use my hot tub or swimming pool?

No. We do not advise using hot tubs or swimming pools.

Q13 - Is potentially contaminated water safe for washing dishes?

Use a dishwasher to wash dishes and use air dry setting.

Q14 - Is potentially contaminated water safe for washing clothes?

It is safe to wash clothes in tap water in cold water. If the clothes dryer does not vent outside, avoid using it (dry laundry outdoors).

Q15 - Is potentially contaminated water safe for bathing and shaving?

Your water may be used by healthy individuals for showering, bathing, shaving, and washing as long as care is taken not to swallow water and avoid shaving nicks. Limit shower time/bathing, and do not take hot baths (use lukewarm water and ventilate area).

Children and disabled individuals should be supervised to ensure water is not ingested. Sponge bathing is advisable, and bathing time should be minimized to further reduce the potential for ingestion.

Q16- How should I wash my hands?

Generally, vigorous hand washing with soap and your tap water is safe for basic personal hygiene. If you are washing your hands to prepare food, you should use bottled water or water from another acceptable source for hand washing.

Q17 - Is the water safe to give to my pet?

No, use bottled water for pets and domestic animals.

Q18- Does this Notice affect how I can use my toilets?

There is no restriction or concern about using your toilet. However, please try to conserve water if possible to aid in the firefighting efforts.

Q19 - What if I have already consumed potentially contaminated water?

The likelihood of becoming ill is low. However, illness is possible, especially for people that have a chronic illness or may be immunocompromised.

Anyone experiencing symptoms of gastroenteritis, such as diarrhea, nausea, vomiting, abdominal cramps, with or without fever, should seek medical attention. These symptoms are not unique to exposure to potential contaminants/organisms in the water, and a doctor's involvement is key to identifying the cause of your illness. If your doctor suspects a waterborne illness, you may be asked to provide blood and/or stool samples.

Q20 - What should customers do when the Do Not Drink notice is lifted?

- Flush household pipes/faucets first: To flush your plumbing, run all your cold water faucets on full for at least 5 minutes each. If your service connection is long or complex (like in an apartment building) consider flushing for a longer period. Your building superintendent or landlord should be able to advise you on longer flushing times.
- Automatic ice makers: Dump existing ice and flush the water feed lines by making and discarding three batches of ice cubes. Wipe down the ice bin with a disinfectant. If your water feed line to the machine is longer than 20 feet, increase to five batches.
- Hot water heaters, water coolers, in line filters, and other appliances with direct water connections or water tanks: Run enough water to completely replace at least one full volume of all lines and tanks. If your filters are near the end of their life, replace them.
- Water softeners: Run through a regeneration cycle.
- Reverse Osmosis (RO) units: Replace pre-filters, check owner's manual.
- Replace other water filters, as they are disposable and may be contaminated. This applies especially to carbon filters and others that are near the end of their life.

Aviso de No Beber
Preguntas Frecuentes

10 de enero de 2025

P1 - ¿Por qué se emitió un aviso de no beber mi agua?

Se emitió un aviso de no beber porque las estructuras en Pacific Palisades fueron destruidas por el fuego y algunas áreas en el sistema de distribución de agua perdieron presión. Estas condiciones pueden haber causado que contaminantes dañinos, incluido el benceno y otros productos compuestos orgánicos volátiles (COV), ingresen al sistema de agua. Como **medida de precaución**, la División de Agua Potable de la Junta Estatal de Control de Recursos de Agua, el Departamento de Salud Pública del Condado de Los Ángeles y El Departamento de Agua y Energía de Los Ángeles (LADWP, por sus siglas en inglés) aconsejan a los consumidores de la zona afectada que NO UTILICEN EL AGUA DE LA LLAVE PARA BEBER Y COCINAR HASTA NUEVO AVISO.

P2 - ¿Está proporcionando LADWP agua embotellada para clientes afectados de LADWP?

LADWP distribuirá agua embotellada a los clientes afectados en dos ubicaciones de distribución: Westwood Recreation Center, 1350 S. Sepulveda Blvd., Los Angeles, CA 90025 (a partir de las 8 am) y adyacente a Brentwood Country Club, 741 S. Gretna Green Way, Los Angeles, CA 90049. LADWP estará presente para distribuir una (1) caja de 24 botellas por hogar. Para obtener más información, llame a 1-800-DIAL-DWP.

P3 - ¿Por cuánto tiempo estará vigente el Aviso de No Beber?

El LADWP le informará cuándo se pueda restablecer una presión de agua, adecuada y las pruebas demuestren que el agua es segura para beber. El tiempo estimado para resolver la situación es desconocido y depende de las condiciones relacionadas con el incendio, vientos y otros factores.

P4 - ¿Por qué se cambió el aviso de hervir el agua a un aviso de no beber?

Se emite un aviso de no beber cuando un sistema de agua experimenta impactos de incendios forestales y puede tener contaminación relacionada con el fuego. Como medida de precaución, este Aviso se emite hasta que los datos de la prueba estén disponibles.
Debido a la baja presión causada por el incendio, nuestra agua puede estar contaminada con productos químicos que no pueden ser eliminados por los usuarios. Cuando la presión baja mucho, el sistema puede absorber los contaminantes de estructuras y equipos quemados y distribuirlos por él sistema. Entre estos contaminantes se encuentran el benceno y otros COV que no pueden ser eliminados con desinfectantes como la lejía o por sistemas comunes de filtración doméstica. Hervir el agua contaminada vaporizaría esos químicos en el aire que respira.

P5 – ¿Puedo tratar el agua yo mismo?

No. Hervir, congelar, filtrar, agregar cloro u otros desinfectantes, o dejar reposar el agua no hará que el agua sea segura.

P6 - ¿Debo limitar el uso de agua caliente?
Sí, debido a la capacidad de los COV de vaporizarse a temperaturas bajas y convertirse en partículas en el aire. Utilice una ventilación adecuada al usar agua en interiores.

P7 – ¿Puedo usar agua de la llave para beber y cocinar?
No. Use solo agua embotellada o una fuente alternativa de agua.

P8 - ¿Es seguro usar agua embotellada?
Es seguro usar agua embotellada. El agua embotellada debe usarse para beber (incluyendo para fórmula de bebés y jugo), cepillarse los dientes y preparar hielo y alimentos.

P9 - ¿Qué recipiente debo usar para obtener agua de otro lugar?
El recipiente que utilice para obtener agua de una fuente alternativa o una estación de agua temporal puede afectar significativamente la calidad del agua. Nunca use un recipiente que haya contenido un producto químico, gasolina u otro combustible. Use únicamente recipientes limpios que sepa que sean adecuados y estén libres de suciedad y contaminantes.

P10 - ¿Puedo usar mi agua para cocinar?
No, cualquier agua utilizada para la preparación o cocción de alimentos debe provenir de agua embotellada o de una fuente alternativa.

P11 - ¿Puedo usar hielo?
Sí, si se hace con agua embotellada. No use hielo de máquinas de hielo automáticas.

P12 – ¿Puedo usar mi jacuzzi o piscina?
No. No aconsejamos el uso de jacuzzis o piscinas.

P13 - ¿Es segura el agua potencialmente contaminada para lavar los platos?
Use un lavavajillas para lavar los platos y use la configuración de secado al aire.

P14 - ¿Es segura el agua potencialmente contaminada para lavar la ropa?
Es seguro lavar la ropa con agua fría de la llave. Si la secadora no emite hacia el aire libre, evite usarla (seque su ropa al aire libre).

P15 - ¿Es segura el agua potencialmente contaminada para bañarse y afeitarse?
El agua puede ser utilizada por personas sanas para ducharse, bañarse, afeitarse y lavarse, siempre y cuando se tenga cuidado de no ingerir el agua y evitar las cortadas de afeitado. Limite el tiempo de ducha, y no tome baños con agua caliente (use agua tibia y ventile el área). Los niños y las personas discapacitadas deben ser supervisados para asegurarse de que no se ingiera agua. Es aconsejable bañarse con esponja y el tiempo de baño debe minimizarse para reducir aún más la posibilidad de ingestión.

P16- ¿Cómo debo lavarme las manos?
Por lo general, lavarse las manos enérgicamente con jabón y agua de la llave es seguro para la higiene personal básica. Si se lava las manos para preparar alimentos, debe usar agua embotellada o agua de otra fuente aceptable.

Q17 - ¿Es seguro darle el agua a mi mascota?
No, use agua embotellada para mascotas y animales domésticos.

P18- ¿Este Aviso afecta la forma en que puedo usar mis baños?
No hay ninguna restricción o preocupación sobre el uso de su baño. Sin embargo, trate de conservar el agua si es posible para ayudar en los esfuerzos de extinción de incendios.

P19 - ¿Qué pasa si ya he consumido agua potencialmente contaminada?
La probabilidad de enfermarse es baja. Sin embargo, si es posible coma especialmente para las personas que tienen una enfermedad crónica o que pueden estar inmunocomprometidas. Cualquier persona que experimente síntomas de gastroenteritis como diarrea, náuseas, vómitos, calambres abdominales con o sin fiebre debe buscar atención médica. Estos síntomas no son exclusivos de la exposición a posibles contaminantes/organismos en el agua y la intervención de un médico es clave para identificar la causa de su enfermedad. Si su médico sospecha de una enfermedad transmitida por el agua, es posible que le pida que proporcionen muestras de sangre y/o heces.

P20 - ¿Qué deben hacer los clientes cuando se levanta el aviso de No Beber?

- Primero enjuague las tuberías/llaves del agua de la casa: Para enjuagar la plomería, deje correr todas las llaves de agua fría al máximo durante al menos 5 minutos cada una. Si su conexión de servicio es larga o compleja (como en un edificio de apartamentos), considere enjuagar durante un período más largo. El superintendente del edificio o el propietario deben poder aconsejarle sobre los tiempos de descarga más largos.
- Máquinas de hielo automáticas: Vierta el hielo existente y enjuague las líneas de alimentación de agua haciendo y desechando tres lotes de cubitos de hielo. Limpie el depósito de hielo con un desinfectante. Si su línea de alimentación de agua a la máquina es más larga de 20 pies, aumente a cinco lotes.
- Calentadores de agua, enfriadores de agua, filtros en línea y otros electrodomésticos con conexiones directas de agua o tanques de agua: Deje correr suficiente agua para reemplazar completamente al menos un volumen completo de todas las líneas y tanques. Si sus filtros están cerca del final de su vida útil, reemplácelos.
- Ablandadores de agua: Pasan por un ciclo de regeneración.
- Unidades de ósmosis inversa (RO): Reemplace los prefiltros, consulte el manual del propietario.
- Reemplace otros filtros de agua, ya que son desechables y pueden estar contaminados. Esto se aplica especialmente a los filtros de carbono y otros que están cerca del final de su vida útil.

# # #

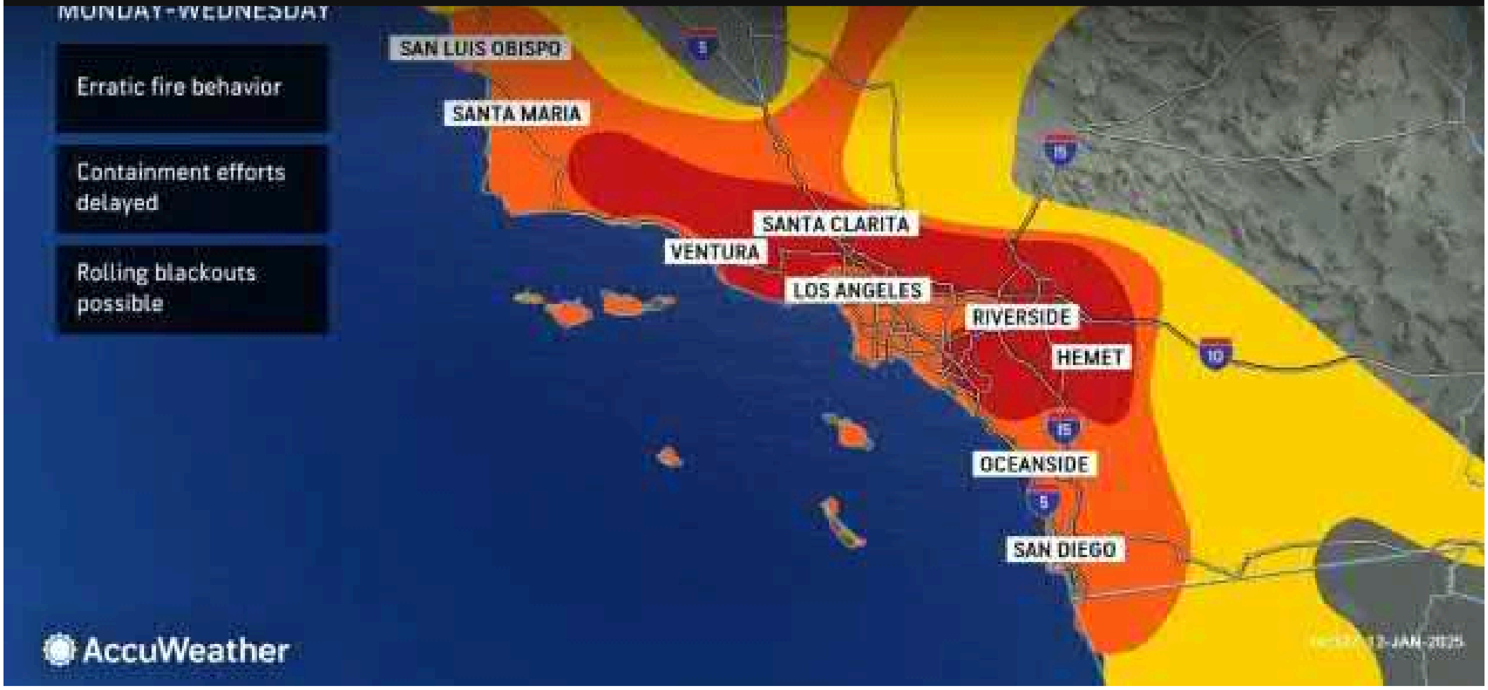
EXHIBIT K

Extreme fire risk in Southern California as powerful Santa Ana winds return

Published Jan 13, 2025 6:42 AM PST

AccuWeather increases preliminary estimate of total damage and economic loss of $250 billion to $275 billion due to what has occurred and what is to come, considering the AccuWeather forecast and long-term impacts to people and the economy of the region.

AccuWeather Global Weather Center – Jan. 12, 2025 - AccuWeather expert meteorologists are warning families, businesses, emergency officials and fire crews throughout Southern California to prepare for another round of extreme fire risk as stronger Santa Ana winds return to the region on Monday. Due to the AccuWeather forecast, in addition to what has already occurred and expected long-term impacts on people's health and the economy of the region, AccuWeather experts are increasing their preliminary estimate of total damage and economic loss of $250 billion to $275 billion.



“This will be another incredibly dangerous week near the fire zones and across much of the Los Angeles region as stronger wind gusts return. Please follow official evacuation orders,” AccuWeather Meteorologist Alex DaSilva said. “We could face another round of hurricane-force wind gusts in some places this week. Powerful wind gusts could ground some firefighting aircrafts at times, which makes it more difficult for crews to contain wind-driven fires.”

AccuWeather is forecasting 60-80 mph wind gusts in areas prone to Santa Ana winds starting Monday through Wednesday morning, with an AccuWeather Local StormMax™ of 100 mph.

With the threat of erratic fire behavior at times, people across Southern California are being urged to prepare for additional evacuation orders, as well of the likelihood of more public safety power shutoffs.

"Embers carried in the wind can quickly spread these fires in suburban areas from house to house," DaSilva said. "People need to be packed up and ready to evacuate in a matter of moments."

AccuWeather expert long-range meteorologists, led by Lead Long Range Meteorologist Paul Pastelok, predict there are minimal rain chances in the Los Angeles area through the end of January, followed by an increased chance of rain during the weeks of Feb. 10 and Feb. 17.

"There could be a shower or two January 18-19, but it is not expected to be meaningful to aid in reducing fire spread or risk. There is another chance of rain January 26-28, but that should also just be a few showers," said Pastelok. "The best chance of rain over the next 6 weeks appears to be February 10-23. If appreciable rain doesn't occur then, it may turn dry into much of March, further exacerbating the situation."

Toxic threats in the wildfire smoke

"The exposure to unhealthy and dangerous wildfire smoke is causing major impacts to physical and mental health for millions of people across the Los Angeles area," said AccuWeather Chief Meteorologist Jonathan Porter.

Poor and unhealthy air quality is expected in parts of the Los Angeles region through much of next week as wildfires continue to burn.

The financial toll of catastrophic fires

AccuWeather has increased its preliminary estimate of the total damage and economic loss from the fast-moving, wind-driven infernos burning across Southern California from $250 billion to $275 billion due to factors such as increased loss of life, long-term financial impacts for cleanup, home values, rebuilding, health and medical impacts because of long-term and early exposure to wildfire smoke as well as significant impacts to infrastructure and business.

"AccuWeather experts, who have been recognized for their severe weather-related loss analyses for years, preliminarily estimate total damage and economic loss between $250 billion to $275 billion, which is as staggering as it is sobering due to one of the most destructive fires in modern U.S. history," said Porter. "Multi-million-dollar homes with priceless contents have already been lost in one of the world's most expensive neighborhoods have contributed to this increase as well as the high costs to mitigate smoke damage and water damage due to fire suppression efforts. There will also certainly be a decrease in real estate values in some of the affected areas as a result of the fires. And perhaps even migration changes as large numbers of people leave California rather than choose to rebuild."

AccuWeather's increased estimate takes into account the damage and destruction of thousands of homes and businesses, damage to utilities and infrastructure, including contamination of water systems from debris, the financial impact of evacuation orders for more than 100,000 people, the long-term cost of rebuilding or relocation for people in densely populated areas whose homes were destroyed, anticipated cleanup and recovery costs, emergency shelter expenses, hospital evacuations, as well as immediate and long-term health care costs for people who were injured or exposed to unhealthy air quality from wildfire smoke and impacts on commerce, both locally and nationally.

devastating impacts or missing key parameters that AccuWeather has identified and is including within its estimates for total damage and economic loss," Porter went on to say. "These other estimates don't even seem to begin to cover the magnitude of the disaster experienced by people whose personal and professional lives may be impacted negatively in the coming years or even a decade."

A panel of health experts are already concluding early exposure to wildfire smoke may cause illness beyond respiratory problems, such as cancer, Alzheimer's disease, and mental illness, especially to vulnerable populations, including pregnant women, young people and the elderly.

"Additionally, no other source takes into account the loss of antiques, priceless heirlooms and irreplaceable items and papers," said Porter.

Unfortunately, the disaster is still unfolding and these wind-driven infernos, powered by high winds, wind gusts, low humidity and an overgrowth of dried foliage acting as fuel, will have ripple effects and negative impacts that will be felt across the state and the nation for the coming months and years.

Fires Follow Destructive 2024 Hurricane Season

Jonathan Porter: "This catastrophic damage in California is happening in the wake an incredibly destructive and costly hurricane season in the United States. These back-to-back weather disasters will lead to even higher insurance rates, and likely, more policies being dropped in high-risk areas."

"AccuWeather estimates that the total damage and economic loss from weather disasters in the United States over the past 12 months has reached $693 billion to $799 billion. We're talking about a financial impact equivalent to almost 3 percent of our nation's annual gross domestic product. $275 billion would represent almost 7% of the GDP of the state of California and about 1% of the GDP for the United States."

"Extreme weather events are occurring more frequently, with more intense impacts, as a result of climate change. This is a serious problem that must be confronted."

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Storm with snow,

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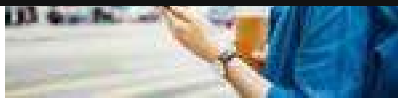

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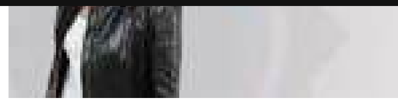

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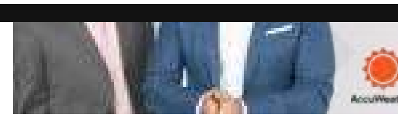

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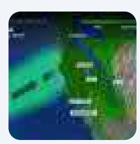

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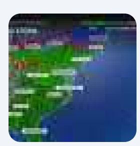

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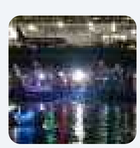

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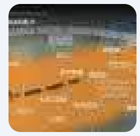

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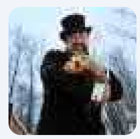

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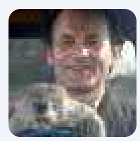

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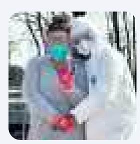

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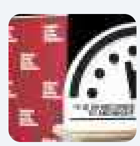

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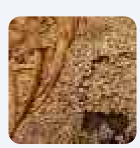

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EXHIBIT L

NEWS / WEATHER NEWS

AccuWeather estimates more than $250 billion in damages and economic loss from LA wildfires

To put the magnitude of loss into context, this latest damage and economic loss estimate surpasses the numbers for the entire 2020 wildfire season.

By Monica Danielle, AccuWeather Managing Editor

Published Jan 13, 2025 1:49 PM PDT | Updated Jan 16, 2025 5:28 AM PDT

AccuWeather's Bill Wadell reported live from Southern California on Jan. 13, showcasing the catastrophic and heartbreaking situation.

As fires continue to rage across Southern California and the scope of catastrophic damage, loss of life, business disruptions and other economic impacts becomes clearer, AccuWeather has updated and increased its preliminary estimate of the total damage and economic loss to between $250 billion and $275 billion.

“These fast-moving, wind-driven infernos have created one of the costliest wildfi
disasters in modern U.S. history
said. “Hurricane-force winds se
multi-million-dollar homes. The
economic toll is staggering."

The worst of the fires are burni
some of the most expensive rea
$2 million. Should a large numb

2/17

Kaegan Baron sifts through the rubble of her mother's home after it was destroyed by the Palisades Fire in the Pacific Palisades neighborhood of Los Angeles, Saturday, Jan. 11, 2025. (AP Photo/John Locher)

To put the magnitude of loss int [redacted] for the fires burning in Southern [redacted] numbers for the entire 2020 wil [redacted] season, Porter noted. The dama [redacted] n the deadly Maui wildfires in 202 [redacted] surpassed the $225 to $250 bill [redacted] 2024's Hurricane Helene.

of help, initially the basic and life-sustaining needs of food, water and shelter, as this tragedy unfolds," Porter said. "Many families will face significant unexpected costs to relocate to another area in Southern California. The recovery process will be extremely expensive and emotionally challenging in the months and years to come."

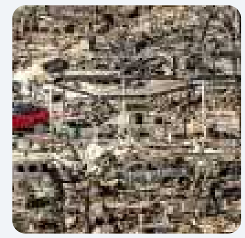
AccuWeather's Ali Reid reported live from Southern California on Jan. 13, sharing the stories of wildfire survivors who are trying to process the magnitude of what's happened.

This update accounts for new a
destruction of thousands of ho
infrastructure, the financial imp
rebuilding or relocation for peo
destroyed, anticipated cleanup
well as immediate and long-ter
exposed to unhealthy air quality from wildfire smoke.

businesses shutting down and jobs being eliminated.

Read more about the Southern California wildfires:

24 dead and thousands of structures destroyed in California wildfires



Stories of heroism emerge as Los Angeles infernos rage

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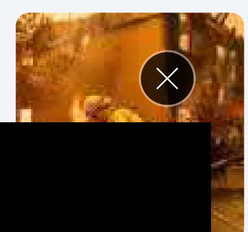

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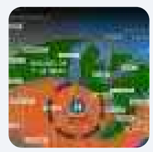

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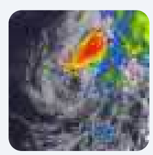

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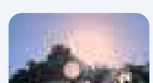

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