UCLA Luskin Center for Innovation

Informing effective and equitable environmental policy

How have the LA Fires affected water systems in LA County?

AN EARLY OVERVIEW

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REPORT

UCLA Luskin Center for Innovation

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EXECUTIVE SUMMARY

In January 2025, Los Angeles (LA) County experienced multiple fast-moving fires that began as wildland events but quickly spread into residential areas, destroying homes and critical infrastructure. The most affected communities were within the Palisades and Eaton fire areas. This report provides an early assessment of the Palisades and Eaton fires' impacts on local water systems, focusing on damage to infrastructure, service disruptions, and the unique vulnerabilities of the affected communities.

Before the fires, the 11 water systems affected by these fires — eight within the Eaton fire burn area and three within the Palisades fire burn area — were generally higher-performing than other water systems in LA County. However, some of these water systems rely on more vulnerable water sources. For example, the Las Flores Water Company, which serves the Altadena community, relies entirely on purchased water from other systems: Rubio Cañon Land & Water Association (which was also affected by the Eaton Fire) and Foothill Municipal Water District. Additionally, before the fires, several of the affected water systems had some of the highest residential customer water bills in LA County due to the higher cost of providing service in these areas.

The percentage of each water system's service area overlapping with the burn area ranged from less than 1% to 88%. The communities served by these systems are predominantly homeowner populations with median household incomes (MHI) well above the LA County average. Further, whereas 54% of LA County households rent and 46% own, the burned areas reflect a very different pattern: on average, approximately 80% of impacted households were owners and only 20% were renters. Most of the affected water systems serve majority non-Hispanic White populations, consistent with broader demographic patterns in high-income, high-ownership areas. However, there are notable exceptions. Several water systems severely impacted by the Eaton fire serve Block Groups with significantly higher proportions of Black residents than the county average of 8%, including Las Flores Water Company (37%), Lincoln Avenue Water Company (30%), and Rubio Cañon Land and Water Association (11%).

Although less immediately visible than water supply issues, wastewater systems were also impacted by the fires. Unlike the widely dispersed Los Angeles water supply system, these impacts were concentrated in only two large wastewater facilities. Much of the focus on wastewater system recovery is on connecting hundreds of septic-reliant homes to city-run sewer systems in fire-affected areas. In partnership with the University of Massachusetts Amherst, we estimate that 38% of onsite-system-served parcels within the fire perimeters sustained structural damage. In contrast, an average of 61% of sewer-served parcels in the same areas were structurally damaged — a disparity that likely reflects the urbanized origin points of the fires.

This report offers an early, high-level overview of how the 2025 Los Angeles fires impacted water systems across the county. Recovery is ongoing, and the fires have sparked critical conversations about drinking water and wastewater system resiliency. Sustained local, state, and federal support is essential to ensure future systems are adaptable and financially sustainable. Without careful planning, there is always a risk of further burdening communities impacted by these fires with unaffordable mandates that may offer little benefit.

1. INTRODUCTION

This report provides a preliminary high-level overview of the impacts of the January 2025 Los Angeles fires on water systems across Los Angeles County. Several fires burned in the LA region in early January 2025, fueled by the combination of extraordinary drought conditions and hurricane-force winds. Collectively, the three largest — the Palisades, the Eaton, and the Hughes fires — claimed 30 lives, destroyed over 27,000 structures, and forced the temporary evacuation of roughly 200,000 people in the county. They also caused serious economic damage, with ultimate property losses estimated to be more than $76 billion, insured losses of $45 billion, and broader estimated economic damage of up to $250 billion. This analysis focuses on the Palisades and Eaton fires because of their major impact on local water systems.

The Palisades and Eaton fires caused significant damage to water system infrastructure. While the Hughes fire encroached directly on State Water Project assets — a critical component of Southern California's water importation network — it was not damaging to local water systems and is, thus, not further analyzed here. This report explores the geographic scope of fire-related impacts on water systems and the populations they serve, distinguishing between burn and non-burn areas. It also discusses emerging, though incomplete, evidence regarding infrastructure damage, cost estimates, and potential recovery pathways.

Our analyses rely on data from the UCLA Luskin Center for Innovation, supported by additional data-analysis efforts performed in the wake of the fires. In addition to water supply, we discuss wastewater — an essential yet largely overlooked element in current discussions of the county's fire recovery. This report does not discuss the effectiveness of water supply for firefighting, system resilience planning for future wildfires, detailed drinking water system quality impacts, or how systems responded during the early hours and days of the fires as these topics are being addressed in parallel research efforts (see Further Resources section). The numbers we cite here are not all final, and many are likely to be refined over time. As such, the main takeaway from this analysis should be focused on trends rather than specific point estimates.

This report also serves as a partial preview of the Southern California Community Water Systems Guide, which will be released by the UCLA Luskin Center for Innovation in late Summer 2025. This guide will report on performance data on all community water systems in Los Angeles, Orange, Ventura, San Bernardino, and Riverside counties, building on analyses completed in 2015 and 2020, which focused only on Los Angeles County Community Water Systems.

2. DATA AND METHODS

The analysis performed in this report relies on a mixture of publicly available data sources and analytical methods, which are briefly described below. More information is available upon request.

2.1. Fire Boundaries and Damaged Structures

We used the following data sources to define fire perimeters and identify structural damage:

- Fire perimeters: CA Perimeters CAL FIRE NIFC FIRIS public view[1] from the California Department of Forestry and Fire Protection.
- Fire damage to structures: CAL FIRE Damage Inspection (DINS) Data from the California Department of Forestry and Fire Protection.

For the wastewater systems analysis, we combined these two data sources to determine an outer boundary of areas of concern reported by CAL FIRE. We then identified parcels within these zones and further narrowed our analysis to parcels that sustained any level of damage, as reported within the DINS data.

2.2. Water Supply System Location, Characterization, and Population Served

We characterized fire-affected water supply systems using three primary datasets in addition to the fire boundaries previously described:

1. State Water Resources Control Board (SWRCB) water system boundaries.
2. American Community Survey (ACS) 5-year 2019-2023 data at the Block Group level.
3. Luskin Center for Innovation (LCI) Southern California Community Water Systems Guide.

We joined the water system boundaries, fire boundaries, and ACS data to create a Block Group-level view of the people served by fire-affected water systems. We then combined that dataset with our updated Southern California Community Water Systems Guide to profile each fire-affected water system. Profile characteristics include median household income,[2] race (from the ACS), and system performance and governance type (from the Southern California Community Water Systems Guide). We also supplemented these profiles with data from other sources. For example, rates data was sourced from a separate LCI data product, and purchased water sources were identified from the California Safe Drinking Water Information System (SDWIS).

1 NIFC = National Interagency Fire Center; FIRIS = Fire Integrated Real-time Intelligence System.

2 Estimates for average median household income per water system are weighted by the number of occupied households in each Block Group.

2.3. Wastewater System Location and Damage Estimates

The team from the University of Massachusetts Amherst, who are co-authors of this analysis, have developed a novel machine-learning model (random forest classifier) that predicts the types of buried wastewater infrastructure (e.g., sewers and septic tanks) of each residence, business, and institution in California. This model leverages the patterns found among the characteristics of homes and businesses with known wastewater system types to predict the wastewater system type where it is unknown. To train the model, we leverage a variety of characteristics (including road networks, building footprints, proximity to wastewater treatment plants, and parcel value data) and have collected available wastewater infrastructure data (incomplete samples that include sewer systems and/or septic systems from 10+ states including data from several California counties). Testing the model in places where it had no previous information showed an accuracy of >95%. This level of performance for census tracts across California that were excluded during model training demonstrates strong model performance on unobserved ("out-of-sample") data.

This model was used to generate estimates of parcels served by onsite wastewater treatment systems or sewer connections in Los Angeles County (95.2% accuracy). Although other datasets exist for each type of wastewater service, they appear to be less complete. Our model suggests that many additional parcels likely have existing wastewater services not captured in those datasets. For example, the government data source for onsite wastewater treatment systems (OWTS) in LA County states that it includes Conventional Onsite Wastewater Treatment Systems and all Non-Conventional Wastewater Treatment Systems in the area. This implies that not all conventional OWTS are included on the map, which demonstrates the need for other techniques, such as the University of Massachusetts Amherst model, to fill in gaps in existing data. Our model estimates present a possible upper bound for the number of parcels served by different types of wastewater infrastructure in Los Angeles County.

2.4. Additional System Damage Estimates and Costs

We also include, where available, secondary sources emerging in local news sources and government documents that provide more detailed damage estimates and associated costs for some systems. These estimates are more ad hoc than the previously discussed methodologies and sources, representing snapshots in time. These sources are cited throughout the report whenever referenced.

3. THE LANDSCAPE AND GEOGRAPHIC EXTENT OF FIRE-AFFECTED WATER SYSTEMS IN LOS ANGELES COUNTY

We begin by identifying the locations of water supply and wastewater systems affected by the Palisades and Eaton fires, both within broader Los Angeles County and those specifically within Los Angeles City boundaries. We then provide a high-level analysis of damage to structures within and across the burn areas.

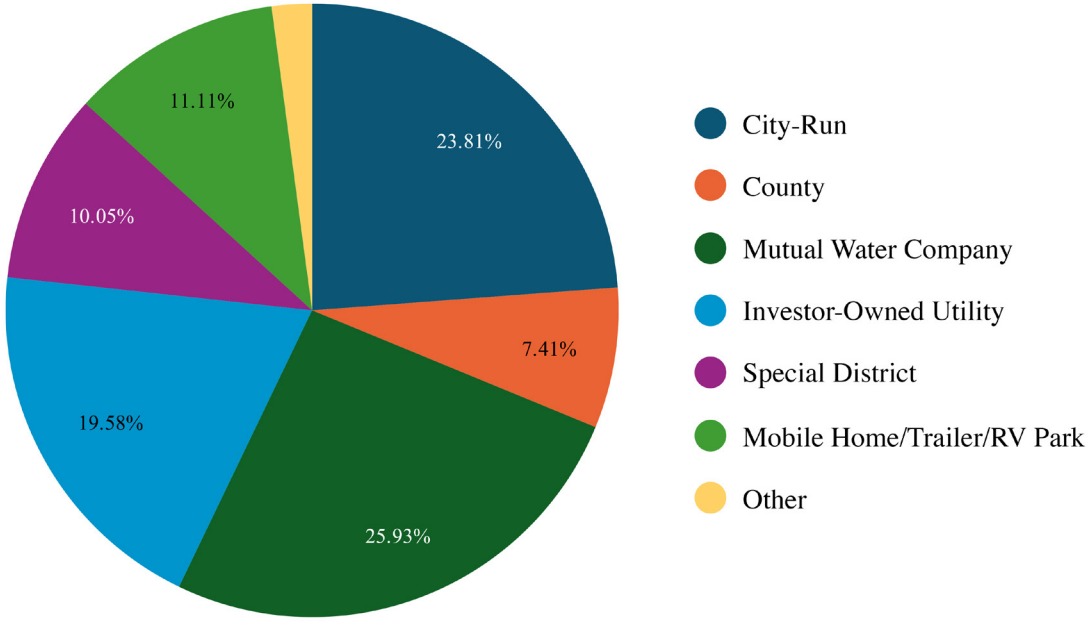
3.1. Water Supply Systems

Water supply systems are known in regulatory terms as community water systems (CWS), which generally supply water to homes, businesses, schools, and other customers in or near cities, including for everyday firefighting. Their core responsibility is to provide a sufficient supply of high-quality water at an affordable price, meeting essential needs for everyday firefighting, drinking, cooking, bathing, and other needs. There are about 200 such CWS in Los Angeles County alone, and they range in size, shape, and complexity. This diversity and fragmentation starkly contrast with the landscape of power utilities in the county, of which there are fewer than 10, with two (SoCal Edison and the Los Angeles Department of Water and Power) serving nearly the entire population. It is important to note that a similar difference in water supply and power utility consolidation characterizes the entire state and country.

Community water supply systems can range from small homeowners' associations or mobile home parks serving only 25 people to the Los Angeles Department of Water and Power (LADWP), which serves almost 4 million customers. However, not everyone living in an urbanized area, such as LA County, is served by a community water system. For instance, some residents in Los Angeles are not served by regulated water systems but instead rely on a largely unregulated private well for their water supply.

FIGURE 1

Proportion of County's Water Systems by Governance Type



Water supply systems in Los Angeles helped fight the January 2025 wildfires. While the state and county lent some support and continue to do so, individual systems were largely on their own in these efforts and emergency response in general.[3]

By our best estimates, consistent with other published lists, 11 community water systems were directly affected by the LA fires in addition to the LADWP, shown in Table 1.

3 Vital forms of support, activated during the fires and essential to firefighting and limiting system damages, include interties (water supply connections between systems), existing mutual aid agreements, and ad hoc assistance between systems. For further details, see LA County Department of Public Works (2025), American Water Works Association (2025), and Hamilton & James (2025).

TABLE 1

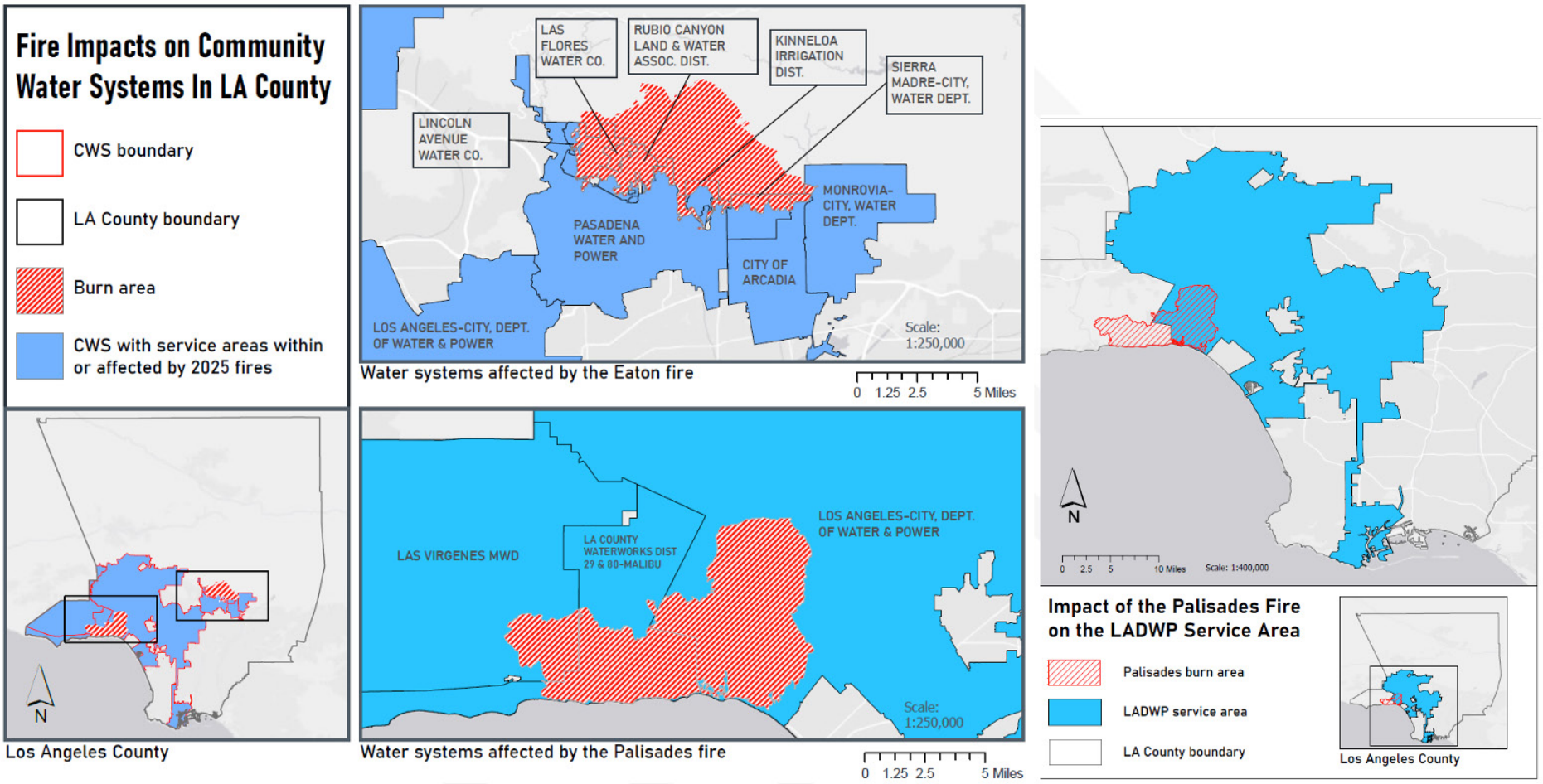
Fire-Affected Water Supply Systems, Ordered by Size

System Name	Population Served (SDWIS)	Connections (SDWIS)
LOS ANGELES-CITY, DEPT. OF WATER & POWER	3,856,043	708,607
PASADENA WATER AND POWER	161,162	38,338
LAS VIRGENES MUNICIPAL WATER DISTRICT	72,602	20,162
CITY OF ARCADIA	45,764	15,218
MONROVIA-CITY, WATER DEPT.	37,931	9,425
LA COUNTY WATERWORKS, DISTRICTS 29 & 80-MALIBU	32,792	8,065
LINCOLN AVENUE WATER CO.	16,126	4,493
SIERRA MADRE-CITY, WATER DEPT.	11,000	3,797
RUBIO CAÑON LAND & WATER ASSOCIATION	9,600	3,136
LAS FLORES WATER CO.	4,847	1,479
KINNELOA IRRIGATION DISTRICT	1,953	592

Figure 2 shows the locations of the affected water systems with respect to the Eaton fire and Palisades fire boundaries. At least eight systems were directly affected by, or in the burn area of, the Eaton fire. In contrast, three systems were directly affected by, or in the burn area of, the Palisades fire.

FIGURE 2

Systems Affected by Wildfires in Los Angeles County and the City of Los Angeles



The percentage of the system service area affected varied widely across the 11 impacted systems, as shown in Table 2. The percentage of estimated service area boundary overlapping with the burn area ranged from less than 1% for the City of Monrovia Water Department and only about 5% for LADWP to up to 88% for Las Flores Water Company. We caution that these numbers represent maximum area impacts and are larger than the percentage of residences burned or the number of accounts affected in the fires within systems for several reasons.[4] For instance, the Lincoln Avenue system recently estimated that only 55% of customers' properties had been damaged, and the Kinneloa system estimated only 40 customer properties burned, as compared to the figures in Table 2 (Wilson, 2025).

Figure 2 further highlights the differential impacts of the Palisades fire with respect to jurisdictions. The fire affected the entire Pacific Palisades neighborhood and several surrounding communities, but relatively little of the City of Los Angeles. Affected systems range from the largest in the county (LADWP) to some of the smallest (Kinneloa Irrigation District and Las Flores Water Co.), with several systems in between. Some of the smaller systems serve areas wherein structures were almost entirely destroyed. As mentioned, 88% of the Las Flores service area was in the Eaton fire zone, affecting all Block Groups served by the system. LADWP, on the other hand, saw less than 5% of its service area burned and proportionally less of its customer base impacted. Moreover, Kinneloa and Lincoln have significantly fewer customer accounts affected by the fire than our area burned percentage estimates would suggest (Ross, 2025). Kinneloa has reported that its equipment did not suffer damage in the fire and customers had consistent water access. Lincoln Avenue's reservoirs did suffer fire damage, but the damaged site supports operation of a surface water treatment plant, so water provision was not impacted (Wilson, 2025).

4 These reasons include that water system boundary areas are sometimes overdrawn, that they often reflect authorized rather than served areas, that more residences tend to be concentrated away from system boundary edges in mountainous terrain, and most importantly that not all residences within a burn area are damaged or destroyed.

TABLE 2

Fire-Affected Systems Ranked by Approximate Percent of System Boundary Area Burned

System Name	% Approximate CWS Boundary Area Burned
LAS FLORES WATER CO.	88%
RUBIO CAÑON LAND & WATER ASSOCIATION	79%
LINCOLN AVENUE WATER CO.	73%
KINNELOA IRRIGATION DISTRICT	53%
SIERRA MADRE-CITY, WATER DEPT.	34%
LA COUNTY WATERWORKS, DISTRICTS 29 & 80-MALIBU	24%
LOS ANGELES-CITY, DEPT. OF WATER & POWER	4.6%
PASADENA WATER AND POWER	3.6%
LAS VIRGENES MUNICIPAL WATER DISTRICT	3.5%
CITY OF ARCADIA	2.0%
MONROVIA-CITY, WATER DEPT.	0.7%

There are also households not connected to a community water system in LA County but instead reliant on private, domestic wells. We estimate that about 1,842 people within the 2025 fire perimeters do not live within water supply system boundaries and, thus, assume those residents rely on private wells for their drinking water.

3.2. Wastewater Systems

Wastewater systems collect, treat, and dispose of wastewater from homes, schools, and businesses. Only two major sewer utilities serve the entire county: the Los Angeles County Sanitation Districts and Los Angeles Sanitation Department (LASAN). The latter serves the city (over 4 million) (LA Sanitation and Environment, n.d.), and the former serves the remainder of the county (5.6 million) (Los Angeles County Sanitation Districts, n.d.).

Given their size, it is not surprising that both regulated collection systems were directly affected by the fires: the Eaton fire for the Los Angeles County Sanitation Districts and the Palisades fire for the city's sanitation department. At the same time, it is important to note that a significant number of people are not connected to a public sewer system; this number is much greater than the population that relies on private, domestic wells for drinking water. Instead, they rely on an onsite wastewater system (OWTS) — known more colloquially as a septic system — which is the equivalent of a private well for water supply.

Figure 3 displays our estimates of damage to parcels served by different types of wastewater systems across the county with respect to fire boundary areas.

FIGURE 3

Fire Impacts on Wastewater Systems in LA County

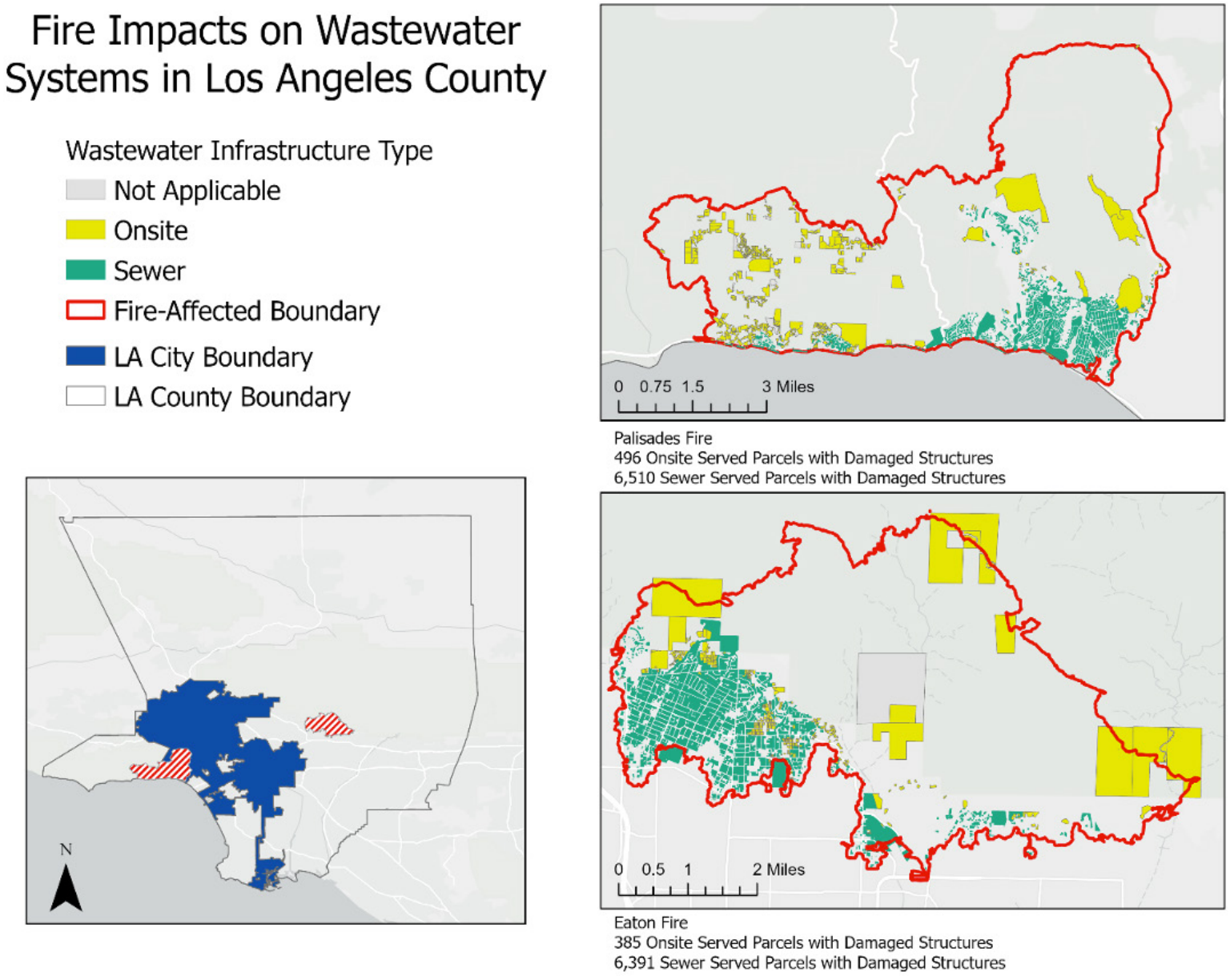


Table 3 compares how parcels served by different types of wastewater systems were impacted by the fires. About 10% of parcels in both burn areas relied on onsite systems — a notably higher proportion than the proportion of people served by private water supply wells which was estimated to be less than 3%. We estimate that 38% of onsite system-served parcels in the perimeters of both fires had structural damage. In contrast, an average of 61% of sewer-served parcels in the estimated perimeters of the fires had structural damage. This counterintuitive disparity hints at the very urbanized origin points of both conflagrations.

At the same time, it is important to note that these estimates do not necessarily reflect damage directly to onsite systems or sewer connections. Rather, they represent a possible upper bound for the number of impacted systems within fire perimeter boundaries. These estimates also suggest that patches of onsite-served parcels exist in close proximity to — or even within — the sewer-service boundaries in each area. This characteristic should not be overlooked when restoring or improving wastewater service to these areas. These areas may be prime points of interest for septic-sewer integration or sewer-extension projects currently being discussed. We return to both these points in a later section of this report discussing paths forward for recovery.

TABLE 3

Fire Impacts to Onsite and Sewer-Served Parcels Wastewater Parcels

Fire Incident	# Onsite-Served Parcels in Affected Zone	# Sewer-Served Parcels in Affected Zone	# Onsite-Served Parcels with Damaged Structures	# Sewer-Served Parcels with Damaged Structures	% Damaged Onsite Parcels in Affected Area	% Damaged Sewer Parcels in Affected Area
Eaton	1,004	11,063	385	6,391	38%	58%
Palisades	1,290	9,983	496	6,510	38%	65%
Total	**2,294**	**21,046**	**881**	**12,901**	**38%**	**61%**

4. WHAT ARE THE DIFFERENT CAPACITIES AND VULNERABILITIES OF THE WATER SUPPLY SYSTEMS AND THEIR POPULATIONS?

We further explore key characteristics of the water systems and populations they serve, distinguishing between burn and unburned areas. This section focuses exclusively on water supply systems because of their diversity compared to the county's regulated wastewater systems. Additionally, the city's water supply system (LADWP) and its wastewater utility service area (LASAN) are nearly identical, so analysis of LASAN governance and demographics is duplicative. Unlike its wastewater systems, the county's water supply systems vary widely in size, capacity, and vulnerability, particularly with respect to recovery financing and funding streams.

Demographic estimates are based on census data at the Block Group level and only consider Block Groups served by one of the 11 affected water systems. As such, recent demographic profiles of overall burn-area demographics[5] are complementary, but not perfectly comparable to our system profiles.

4.1. Pre-Fire Performance of Fire-Affected Systems

It is important to highlight the state of these water systems before January 2025. Our in-progress 2025 broader performance analysis — which did not account for fire risk (de Guzman et al., forthcoming) — found the 11 affected systems generally more capable and high-performing than many in the county. Three systems among the 11 scored in the No Concern category, four in the Minimal Concern category, and two in the Limited Concern category. Only one system, the City of Arcadia, scored in the Moderate Concern category.

4.2. Governance Type and Source Reliance

Half of the affected systems, including the largest, are run by different cities within the county (n = 5). On the other hand, three of the smaller or medium-sized systems are currently ineligible to receive many types of public funding because they are mutual water benefit companies. All affected systems have multiple water sources, though a few currently rely entirely on purchased water, including the Water Works Districts 29 & 80-Malibu and Las Virgenes Municipal Water District in the Palisades fire and Las Flores Water Co. in the Eaton fire. One of Las Flores' purchased water sources is Rubio Cañon, another system severely impacted by the Eaton fire. Three of the most affected systems — Rubio, Lincoln, and Las Flores — also purchase water from Foothill Municipal Water District (a local wholesaler).

5 For example, see USC's Neighborhood Data for Social Change profiles of Census Tracts in the Palisades and Eaton fire areas.

TABLE 4

Fire-Affected Systems Grouped by Governance Type (with primary water source)

System Name	Governance Type	Primary Water Source
SIERRA MADRE-CITY, WATER DEPT.	City	Purchased Surface Water
MONROVIA-CITY, WATER DEPT.	City	Groundwater
CITY OF ARCADIA	City	Groundwater
PASADENA WATER AND POWER	City	Purchased Surface Water
LOS ANGELES-CITY, DEPT. OF WATER & POWER	City	Surface Water
LA COUNTY WATERWORKS, DISTRICTS 29 & 80-MALIBU	County Waterworks District	Purchased Surface Water
KINNELOA IRRIGATION DISTRICT	Irrigation District	Groundwater
LAS VIRGENES MUNICIPAL WATER DISTRICT	Municipal Water District	Surface Water
LAS FLORES WATER CO.	Mutual Benefit	Purchased Surface Water
RUBIO CAÑON LAND & WATER ASSOCIATION	Mutual Benefit	Surface Water
LINCOLN AVENUE WATER CO.	Mutual Benefit	Surface Water

4.3. System and Household Financial Vulnerabilities

One major concern regarding impacts to water supply systems is how to pay for repairs to damaged infrastructure and restoring service in addition to investing in greater resilience. While federal and state funds[6] may fill some emergency and recovery gaps,[7] local and regional systems will likely remain partly — if not entirely — financially self-dependent to pay for repairs and future resilience, as they are with all their costs (Kane, Tomer & Swedberg, 2025). Meanwhile, some of these same systems are recovering much less revenue than typical, given the dislocation of their customer base (Ross, 2025).

Prior to the fires, several of the now-affected systems had some of the highest residential customer water bills in the county, reflecting the comparatively higher cost of service to provide water in these areas. The highest residential customer bill (at the modest consumption level of 6 CCF) among affected systems belongs to the Kinneloa Irrigation District at $122.92 — more than 200% of the county average. Only three of the affected systems (City of Arcadia, Rubio Cañon,

6 For instance, Paradise Irrigation District which suffered comprehensive damage in the Camp Fire, received 2 full years of operational funding from the state (Foothill Municipal Water District, 2025a).

7 In normal circumstances, FEMA could cover a substantial portion of the damage costs to public facilities (Szabo, 2025).

and Pasadena Water and Power) had 6 CCF rates that barely fell below the county average. At the 12 CCF consumption level, Pasadena's rates exceeded the county average slightly.

On the other hand, given that most of these systems serve customer bases with a median household income well above the county average, higher bill levels may not represent an affordability concern as typically defined by the State Water Board[8] or other researchers. These bills represent a small fraction of the typical fire-affected household's monthly income (ranging from 0.46% to 0.82%).[9] However, paying water bills may become more difficult for some residents, as they experience income disruptions along with a range of other costs related to the fires. Moreover, lower-income households are not represented by our averages in each affected area. For example, within the Rubio Cañon system, Block Group 4 in census tract 4602 has a median household income of $69,112 (Data Commons, n.d.) — less than half the average for the Block Groups in Rubio Cañon's service area. We also assume there are lower-income households not represented at the Block Group level in every water system's service area.

8 The California State Water Board has developed an affordability assessment methodology based on three indicators: 1) % MHI which measures whether monthly water charges exceed 1.5% of the water system's MHI; 2) Extreme Water Bill which identifies systems whose monthly bills exceed 150% and 200% of the statewide average; 3) Household Socioeconomic Burden which identifies systems that serve communities with high levels of poverty and high housing costs (State Water Board, 2024).

9 We also note that many of the residents who pay for water supply in the burn area may not pay a sewer bill, because they rely on onsite wastewater systems (see below).

TABLE 5

Current Water Bill Levels for Fire-Affected Systems Compared to Income Levels

System Name	Bill Total (6 CCF)	% of County Avg. (6 CCF)	6 CCF/MHI	Avg. MHI in All Block Groups Served by CWS
KINNELOA IRRIGATION DISTRICT	$122.92	213.29%	0.61%	$241,191
SIERRA MADRE-CITY, WATER DEPT.	$93.48	162.21%	0.81%	$138,407
LA COUNTY WATERWORKS, DISTRICTS 29 & 80-MALIBU	$56.79	98.54%	0.39%	$175,360
LAS VIRGENES MUNICIPAL WATER DISTRICT	$75.72	131.40%	0.54%	$169,750
LAS FLORES WATER CO.	$69.67	120.89%	0.64%	$130,849
CITY OF LOS ANGELES-CITY, DEPT. OF WATER & POWER	$60.21	104.48%	0.82%	$87,774
MONROVIA-CITY, WATER DEPT.	$59.78	103.73%	0.71%	$100,814
LINCOLN AVENUE WATER CO.	$58.43	101.39%	0.55%	$127,562
CITY OF ARCADIA	$54.13	93.93%	0.59%	$110,374
RUBIO CAÑON LAND & WATER ASSOCIATION	$54.00	93.70%	0.46%	$141,722
PASADENA WATER AND POWER	$52.12	90.44%	0.57%	$109,911
County Average (adjusted for inflation)	**$57.63**			**County Avg. MHI: $87,760**

Bill data was compiled from water systems' rate sheets.

Households in all affected systems except LADWP/the City of Los Angeles (which, again, saw a relatively small percentage of its service area burned) have higher incomes than the county average of $87,760. This holds true for the burned areas within each system — they, too, have a higher median income than the county average (including the portion of LADWP directly affected), with median household incomes in burned Block Groups ranging from $127,562 (for Lincoln Avenue Water Co.) to $246,250 (for City of Arcadia).

Within all affected systems, the burned area income was higher than the unburned area income, sometimes dramatically so. For example, compared to a median household income of $246,250 in Burned Block Groups served by the City of Arcadia, the household income in unburned Block Groups was $107,099. Likewise, the City of Monrovia Water Department's affected area had a household income of $150,145 versus $98,590 in the unburned area. This pattern is especially important to note in the context of LADWP and the City of Los Angeles, whose burned Block Groups in the Palisades had a median household income of $196,029, more than double the median household income of $86,742 in its unburned Block Groups.

TABLE 6

Average MHI in Burned vs. Unburned Block Groups Served by Fire-Affected Systems

System Name	Avg. MHI in Burn Area	Avg. MHI Outside Burn Area	Avg. MHI in All Block Groups Served by CWS
CITY OF ARCADIA	$246,250	$107,099	$110,374
KINNELOA IRRIGATION DISTRICT	$241,191	NA	$241,191
LAS VIRGENES MUNICIPAL WATER DISTRICT	$202,763	$168,802	$169,750
SIERRA MADRE-CITY, WATER DEPT.	$200,594	$115,579	$138,407
LOS ANGELES-CITY, DEPT. OF WATER & POWER	$196,029	$86,742	$87,774
LA COUNTY WATERWORKS, DISTRICTS 29 & 80-MALIBU	$176,022	$174,871	$175,360
MONROVIA-CITY, WATER DEPT.	$150,145	$98,590	$100,814
RUBIO CAÑON LAND & WATER ASSOCIATION	$141,722	NA	$141,722
LAS FLORES WATER CO.	$130,849	NA	$130,849
PASADENA WATER AND POWER	$128,086	$107,105	$109,911
LINCOLN AVENUE WATER CO.	$127,562	NA	$127,562
County Average	**$87,760**		**$87,760**

Source: ACS 5-year data 2019-2023 joined with CAL FIRE data. Average water system median household incomes (MHI) are weighted by the number of occupied households in each Block Group.

4.4. Socioeconomic Trends Across and Within Systems

Demographic patterns in the burn areas also differ from countywide trends in homeownership and renting, with homeowners disproportionately affected. Whereas 54% of LA County households rent and 46% own, an average of roughly 20% of households in burned Block Groups were renters and 80% were owners. The three water systems with the highest proportion of renters were Las Virgenes Municipal Water District, Water Works Districts 29 & 80-Malibu, and Pasadena Water and Power. However, these trends do not mean there are no important, sizable pockets of preexisting housing vulnerability in the burn areas within systems. For instance, in the Palisades burn area, 361 mobile homes were destroyed. In the Palisades and Eaton burn areas, 231 multifamily buildings (or 853 units) were destroyed, while 80 buildings (or 752 units) were damaged (Urban Land Institute, 2025; Pierce, Gabbe & Rosser, 2022).

Most affected systems serve majority non-Hispanic White populations, with some notable exceptions, including the Lincoln Avenue and Las Flores systems. Within systems, non-Hispanic White water system customers were also disproportionately affected by the fires, especially in Block Groups affected by the Palisades fire. We also note that there are several water systems in the Eaton fire zone serving specific Block Groups with a large proportion of Black residents relative to the county average of 8%, including Las Flores Water Co. (37%), Lincoln Avenue Water Co. (30%), and Rubio Cañon (11%).

TABLE 7

Impact of Fires on Non-Hispanic White, Black, and Hispanic Residents

System Name	% Non-Hispanic White in Burn Area	% Non-Hispanic White Outside Burn Area	% Black in Burn Area	% Black Outside Burn Area	% Hispanic or Latino in Burn Area	% Hispanic or Latino Outside Burn Area
LOS ANGELES-CITY, DEPT. OF WATER & POWER	79.90%	28.19%	1.50%	8.55%	4.38%	47.33%
LAS VIRGENES MUNICIPAL WATER DISTRICT	77.47%	69.99%	1.24%	1.89%	7.95%	11.16%
LA COUNTY WATERWORKS, DISTRICTS 29 & 80-MALIBU	72.35%	73.58%	1.51%	0.65%	7.88%	11.46%
KINNELOA IRRIGATION DISTRICT	67.44%	NA	0.43%	NA	11.94%	NA
SIERRA MADRE-CITY, WATER DEPT.	63.55%	52.66%	0.83%	6.93%	13.61%	18.11%
MONROVIA-CITY, WATER DEPT.	54.36%	28.64%	0.86%	6.37%	15.44%	44.10%
RUBIO CAÑON LAND & WATER ASSOCIATION	51.81%	NA	10.64%	NA	23.80%	NA
PASADENA WATER AND POWER	37.81%	35.18%	11.49%	7.34%	33.18%	34.45%
LAS FLORES WATER CO.	35.02%	NA	36.72%	NA	16.60%	NA
CITY OF ARCADIA	32.26%	19.20%	0.00%	1.11%	7.62%	17.23%
LINCOLN AVENUE WATER CO.	28.45%	NA	30.33%	NA	26.12%	NA
County Average	**25%**		**8%**		**48%**	

Source: ACS 5-year data 2019-2023 joined with CAL FIRE data.

5. EMERGING WATER SYSTEM INFRASTRUCTURE DAMAGE ESTIMATES

The final analysis we include in this report is based on secondary sources emerging in local news sources and government documents, especially since mid-March 2025. These sources provide some detailed damage estimates and associated costs for some systems, including water supply systems. However, we caution that these estimates are more ad hoc than the above sources and represent snapshots in time only for specific systems. Overall, city estimates are more specific and less concerning than other county-area systems.

These estimates are very important for (potential) Federal Emergency Services Agency (FEMA), state, and, perhaps, county financial assistance directly provided to systems (Foothill Municipal Water District, 2025b). The damage amounts not covered by higher levels of government will become a financial burden on local communities and systems, which will greatly affect the pace and details of rebuilding.

5.1. Water Supply Systems

Wildfires present many challenges for water supply system planners. These challenges include protecting and rebuilding the system infrastructure, treating post-fire contamination, cleaning water reservoirs, and maintaining power and water access during a fire to provide critical support to firefighters. In terms of damage to key infrastructure, critical components include water storage facilities, water treatment facilities, distribution system infrastructure (local tanks, pipes, hydrants, control valves, etc.), and the power infrastructure needed to move water through distribution systems to end uses. The ability of water systems to maintain power during wildfires is critical for supporting firefighting efforts and minimizing damage to infrastructure.

As systems divert water supply to help fight wildfire, and as fires contaminate water sources, water suppliers face impairments to water quality, which threatens their mandate to maintain reliable water delivery to communities. Wildfires can also introduce dangerous levels of contaminants through its impacts to distribution systems and private premise plumbing. This is largely, but not exclusively, due to a loss of pressure that allows wildfire contaminants like ash, soot, and smoke to infiltrate the water supply through damaged pipes and open hydrants. Burned or melted water infrastructure — including some storage tanks, distribution pipes, meters, and domestic well infrastructure — can also release dangerous levels of volatile organic compounds (VOCs), like benzene, and semi-VOCs into drinking water supplies.

In response to the water contamination risks, 9 Los Angeles County water utilities impacted by the wildfires issued a variety of “Boil Water,” “Do Not Drink,” or “Do Not Use” advisories over the first four months post-fires (Haggerty, 2025). Most if not all systems affected followed lessons learned based on the experience from recent wildfires, which in the last few years have been developed to address water quality restoration issues (Whelton, 2025). For instance, communities directly impacted by the Eaton fire were issued “Do Not Drink” notices by Kinneloa Irrigation District and Pasadena Water and Power on January 8 and 9, which remained in effect

for about three weeks (Kinneloa Irrigation District, 2025; City of Pasadena, 2025b). The City of Sierra Madre Water System issued its own "Do Not Drink" advisory on January 14, which was lifted 10 days later. About a third of the larger Pasadena area was advised by Pasadena Water and Power to avoid using tap water due to potential contamination for about a week until testing could confirm the water was safe. LADWP restored full drinking water service to the Palisades area two months after the fire. All system-controlled drinking water quality issues were reported to be cleared up by all affected utilities four months (early May 2025) after the fires began (James and Haggerty, 2025). However, many questions and opportunities for improvement in speed, coordination, communication and restoration of consumer confidence in tap water remain across Los Angeles.

5.1.1. Reported Impacts and Ongoing Discussions

Beyond drinking water quality, how have water supply systems reported the damage experienced? We find a wide range of concerns and needs reported across the 11 systems. New information continues to trickle out over time, with one of the most detailed accounts of damage incurred in the Eaton fire being published as we finished this analysis (Wilson, 2025). Levels of damage correspond roughly to the extent of the overlap between a burn area and the system, as well as to system size, with smaller systems of greater concern.

On the most minor end, for instance, although it initially issued a temporary boil water notice, the City of Sierra Madre system quickly stated that it "never lost system pressure in any water zone, and the City did not suffer any damage to its critical water infrastructure" (Los Angeles County Department of Public Health, 2025). Similarly, Las Virgenes reported threats, but not damages, to critical infrastructure and noted its system as performing "well under stress, maintaining water service to both customers and firefighters on the front lines" (Las Virgenes Municipal Water District, 2025). In fact, there is some discussion of Las Virgenes potentially taking on water supply service for a larger area in the region, which the county waterworks district currently provides (Blue Ribbon Commission on Climate Action and Fire-Safe Recovery, 2025).

Despite the profound impacts in the Palisades neighborhood, LADWP has initially estimated $76 million in damages overall, a number likely to rise. It is unclear if a significant portion of this damage was related to the utility's water or power operations (Szabo, 2025). Regardless, as a percentage of total water enterprise operating revenues ($1.64 billion in 2024) or infrastructure, this is not a large extent of damage (KPMG, 2024). The more significant financial questions for LADWP center on two issues: (1) demands for enhanced wildfire-fighting water infrastructure and (2) potential legal liabilities for both water and power operations. While these may initially appear as one-time costs, they could ultimately affect LADWP's credit ratings (Fitch Ratings, 2025) and increase borrowing costs for future infrastructure investments.

Somewhere in the middle of the spectrum, the Eaton fire caused damage to several City of Pasadena reservoirs and pump stations and resulted in the need for substantial debris clearance. (City of Pasadena, 2025a). There was also a temporary suspension of repayment requirements for affected customers, a common practice across all large systems affected

(Pasadena Now, 2025b). Kinneloa Irrigation District also experienced a small to moderate amount of damage from the fire, including to reservoirs and structures, impairments in delivered water quality, and theft post-fires (Las Flores Water Company, Lincoln Avenue Water Company, & Rubio Cañon Land and Water Association, 2025; Ross, 2025; Wilson, 2025).

At the high end of the spectrum, the three Altadena water mutual companies (Las Flores, Lincoln, and Rubio Cañon) have all incurred substantial damage and loss of revenue. They have reported that at least "six reservoirs are out of service due to burned roofs, and there is significant damage to electrical equipment at booster pump stations, pipes, meters, communication systems, and other essential infrastructure" (Las Flores Water Company, Lincoln Avenue Water Company, & Rubio Cañon Land and Water Association, 2025). They are still using temporary operational measures to provide basic supply to some extent. Las Flores lost 75% of its revenue base (Foothill Municipal Water District, 2025b). Debris removal and theft also remain active challenges. With support from the California Association of Mutual Water Companies, the Foothill Municipal Water District and higher levels of government have joined forces and are exploring various pathways of temporary and permanent recovery (Pasadena Now, 2025a). This includes Foothill attempting to acquire FEMA Public Assistance and Disaster Recovery Funding.

The county's Department of Public Works is in the process of standing up support program for small water systems, partially shaped by insight from the January fires response. This program aims to help backstop small systems in responding to and recovering from disasters. However, it does not appear that the county or other large systems in the area are going to provide long-term direct management support for those systems most damaged by the January 2025 fires. The most active novel discussions are related to both the temporary integration of Las Flores with Foothill Municipal Water District, and the potential consolidation between Altadena mutuals. Foothill does not currently directly provide service to end users but rather to 80,000 people indirectly through its eight member agencies, half of which were in the Eaton fire burn area (Foothill Municipal Water District, n.d.).

Motivations for the potential assimilation include "to protect the financial integrity of the Company and assist in the rebuild of the Las Flores system" (Foothill Municipal Water District, 2025a). Specifically, there is potential for Foothill to be eligible for certain public funding that may be unavailable to Las Flores, given mutual water systems' difficulty in accessing certain funds due to their legal entity type. At the same time, there is some interest in considering permanent consolidation between one or more Foothill member water systems and calls for studies on this topic (Foothill Municipal Water District, 2025a; Foothill Municipal Water District, 2025b). On the other hand, other Foothill member agency representatives and members of the public have expressed concern about any major changes in the relationship between Foothill and some of its member agencies. Overall, it is unclear how or if this effort will be financed, whether it can be supported by the state's ongoing efforts to consolidate systems (State Water Resources Control Board, n.d.-b), and what other obstacles might hinder its completion.

In April 2025, law firms Baron & Budd, P.C., and Diab Chambers, LLP, filed lawsuits on behalf of Las Flores, Rubio Cañon, Lincoln, and Kinneloa against the electric utility serving the region, Southern California Edison (SCE). The lawsuits seek compensation for damages to water

infrastructure from the Eaton fire because SCE has acknowledged there was an unexpected failure on its transmission circuit at approximately the same time and location that the fire began (Business Wire, 2025). These lawsuits are in their early stages, and it is uncertain what the final outcome will be.

5.2. Wastewater Systems

As with water supply, there are also multiple pathways of potential damage to different types of wastewater systems, although they may go unnoticed. These damage pathways include direct fire or even firefighting damage to components of the infrastructure of large systems, such as to electrical wires, pumps, controls, pipes, tanks, and other components that may affect system operation and compromise the safety of the water supply or affect the proper disposal of wastewater. Loss of power to facilities may affect the performance of systems. Debris and contaminant levels of water feeding the sewer system may also be a concern, and consequently, sewer lines may be closed off to prevent ash and charred waste from entering water treatment facilities.

At a microscale, and especially relevant to septic-reliant households, sewage backups and spills may occur due to system malfunction or excess water infiltration from firefighting efforts, which saturates the soil around the septic drain field.[10] There may also be damage to pipes — especially plastic pipes — where they enter a home if they were impacted by heat from the fires, and damage to drain fields for septic systems from fallen debris or firefighting equipment. Additionally, fires may have damaged pumps, wiring, aerobic treatment units, and media filter components, impacting onsite systems' functioning.

Published estimates of damage to wastewater systems from the city indicate over $50 million in emergency response costs, primarily related to damage, ranging from minor repairs to complete replacement at 11 pumping plants (Szabo, 2025). There is some mention of the types of impacts mentioned above in public comments regarding parallel county assessments, but these have not been publicly released.

5.2.1. Reported Impacts and Ongoing Discussions

City officials' greatest focus has been on damage to septic systems and connecting them to sewer systems in the context of both fires. This also continues to be a focus on the Maui fires, notably with funding provided for septic-sewer conversion recently by the federal government (Maui Now, 2025). What began in Los Angeles as initial uncertainty regarding damage (Connelly, 2025) and behind-the-scenes conversations have become fully public discussions regarding the integration of several hundred septic systems in the area into existing systems or constructing a new sewer system in the Malibu area of the Palisades burn zone (Mattson, 2025; Rainey, 2025; Santa Monica Mirror, 2025). Extending sewer service is quite costly in this context because of the region's geography and sensitive coastal ecology. These discussions

10 Septic systems rely on unsaturated soil to absorb and treat effluent. If the soil is too wet, it can't function properly, leading to backups or surfacing sewage.

also relate to and can build on existing opportunities but are also complicated by longstanding, contentious efforts to expand the area's municipal sewer system (Groves, 2009). Rebuilding either way is complicated by the tremendous cost (estimated at several hundred thousand dollars to above half a million dollars per unit) of replacing onsite systems to meet current environmental code standards with sea level rise and coastal pollution concerns.

The county has stated its interest in extending service from the existing sewer infrastructure network to roughly 700 homes currently reliant on onsite systems in the Eaton fire area (Palmer, 2025; Saraiya, 2025). It is unclear how or whether this effort will be financed, whether it can be supported by the state's ongoing septic-sewer consolidation efforts (State Water Resources Control Board, n.d.-a), and what other obstacles may complicate its completion.

6. PATHS FORWARD FOR LA COUNTY'S FIRE-AFFECTED WATER SYSTEMS

This report provides an early, high-level overview of how the January 2025 Los Angeles fires have affected water systems across the county. The numbers we cite here are not all final, and many are likely to be refined over time. However, they still help us to understand trends in infrastructure impact, populations affected and recovery pathways.

These fires are undeniable tragedies, and the path to recovery is long for many systems and communities. While recovery is ongoing, the fires have also sparked unprecedented regional conversations on water system expectations, support, and integration, which we have outlined. However, repair and recovery discussions for water systems are very much in progress, and thus, this report represents a snapshot in time.

We will continue to seek to understand and inform the recovery, preparedness, and greater resilience of LA water systems from the fires and future climate-related disasters. We note that the Water Working Group of LA County's Blue Ribbon Commission has recently released initial recommendations to support affected water systems and more holistic fire-related water management concerns across the county (Blue Ribbon Commission on Climate Action and Fire-Safe Recovery, 2025).

More broadly, water systems in fire-prone areas need to continue to be supported by local, state, and federal agencies to get back on their feet and consider feasible management resilience options in the long term. Without a higher willingness to pay for water services, public expectations and potential regulatory demands to over-design systems could saddle communities and the agencies that serve them with infrastructure that they cannot afford, jeopardizing water systems' fiscal integrity and putting households at risk of further water debt and service shutoffs.

Investing in increased wildfire fighting capacity also competes with other pressing demands for investments in water supply and wastewater systems to transition to more local and recycled supply, to enhance reliability, to address legacy and emerging contaminants (including some that wildfire may contribute to surface and groundwater), to increase affordability for low-income customers, and to mitigate and adapt to other climate-driven impacts, including drought and flooding. When considering massive new costs for urban water systems, we must look harder at the distribution of benefits from these investments and design legal and fiscal cost recovery mechanisms that align with those benefits. Otherwise, we risk imposing unrealistic, unfunded and under-justified mandates on local systems and communities that may have little benefit or even negative impacts. We can plan more effectively, and our systems and communities deserve nothing less.

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