

RECOVERY: Wildfire Recovery, Adaptation, and Long- Term Health Impacts

*Systems Coordination, Research,
and Recovery Innovation*

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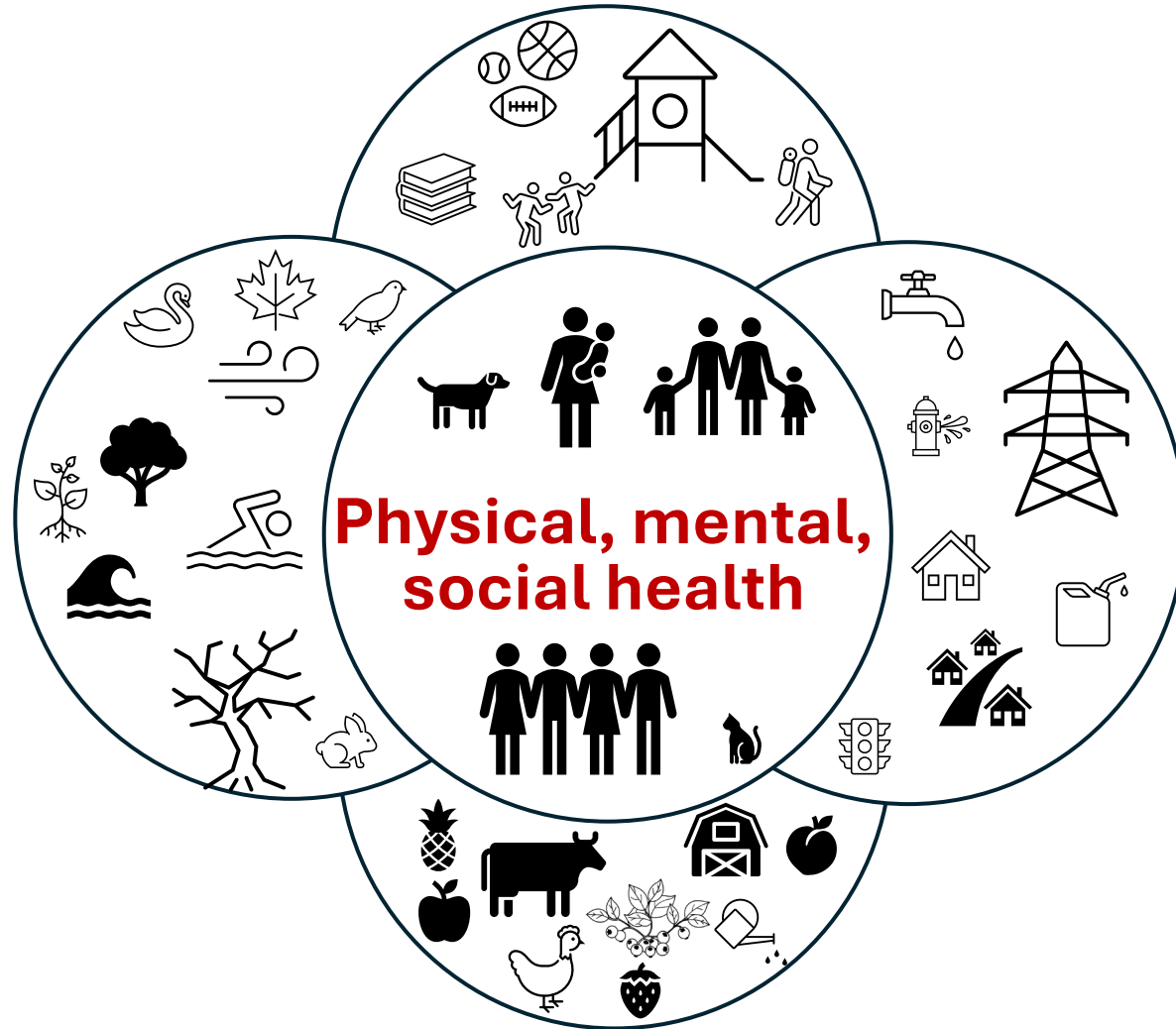
June 15, 2026



U.S. National Academies' Forum for Medical & Public Health Preparedness for Disasters and Emergencies

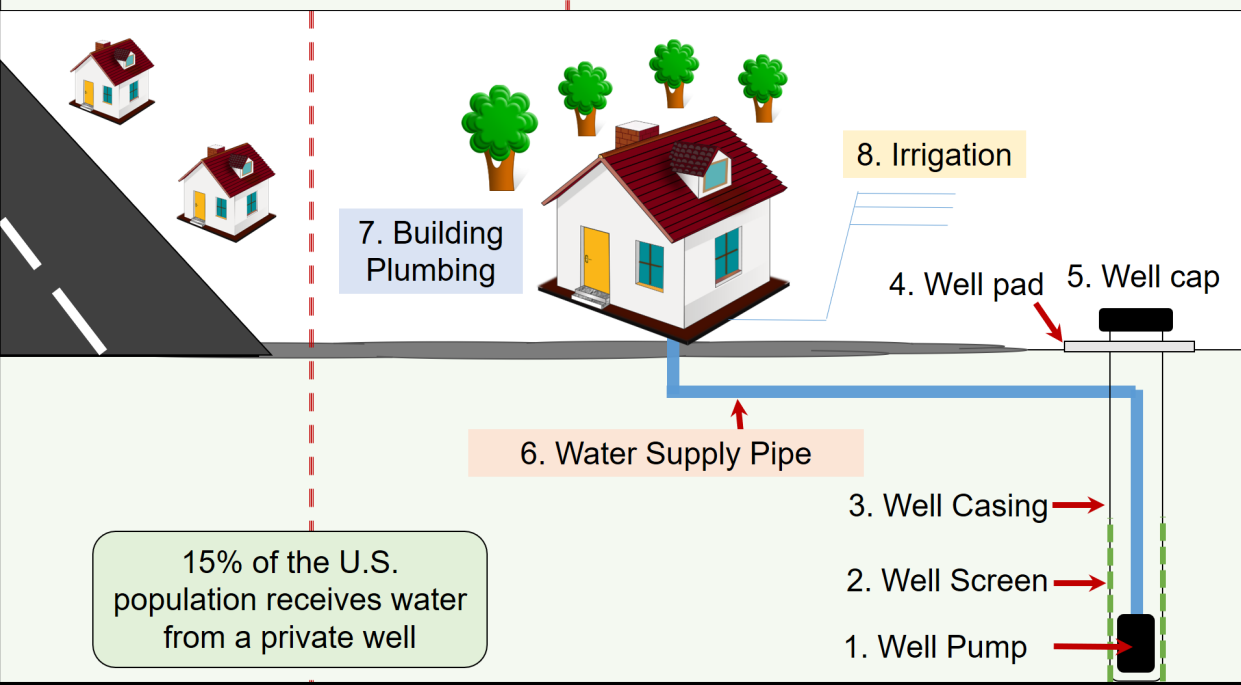
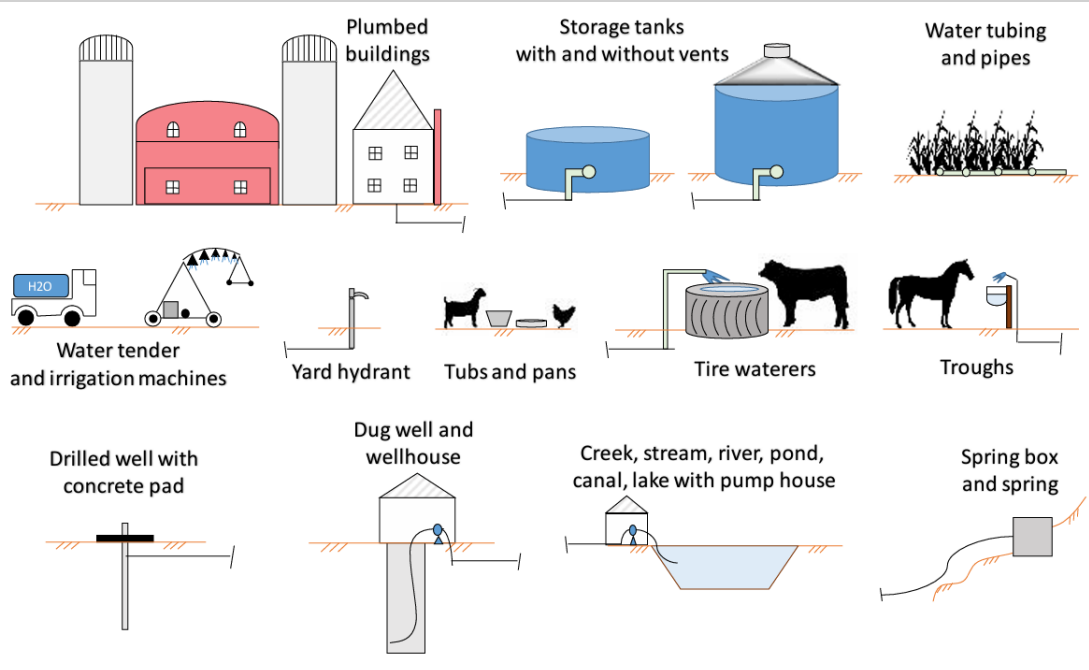
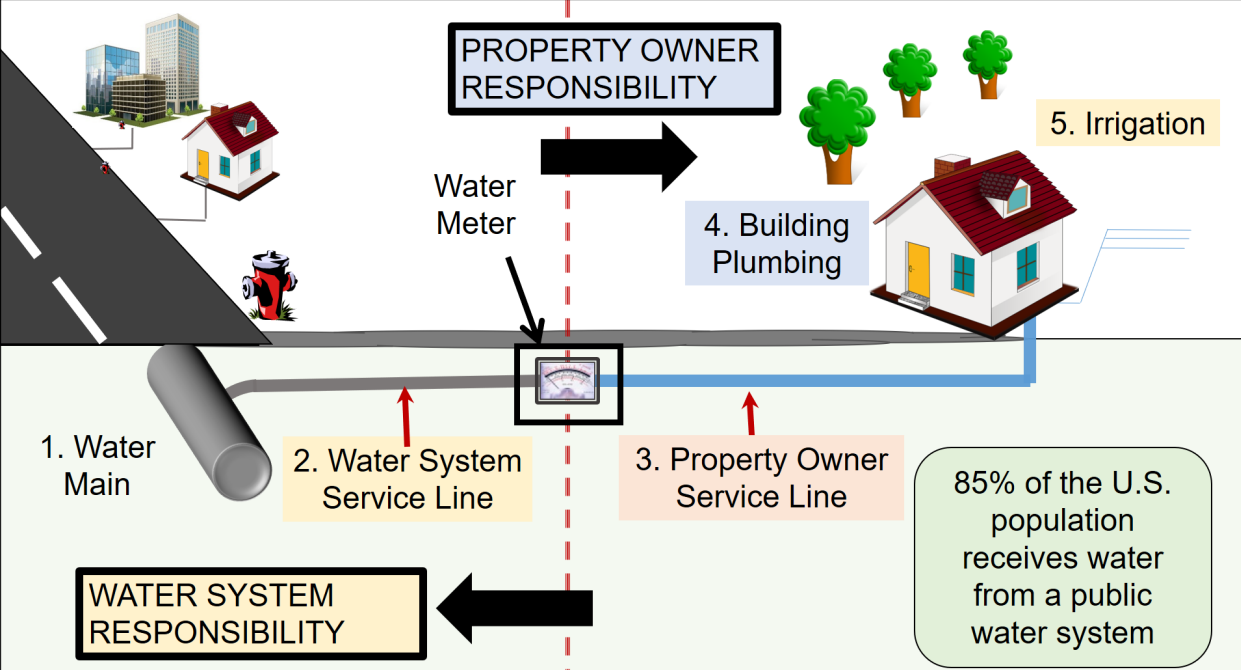
Social systems

Natural systems



Infrastructure systems

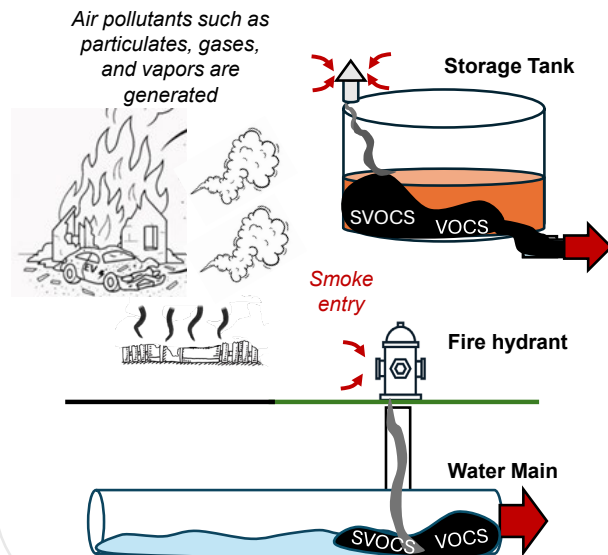
Food systems



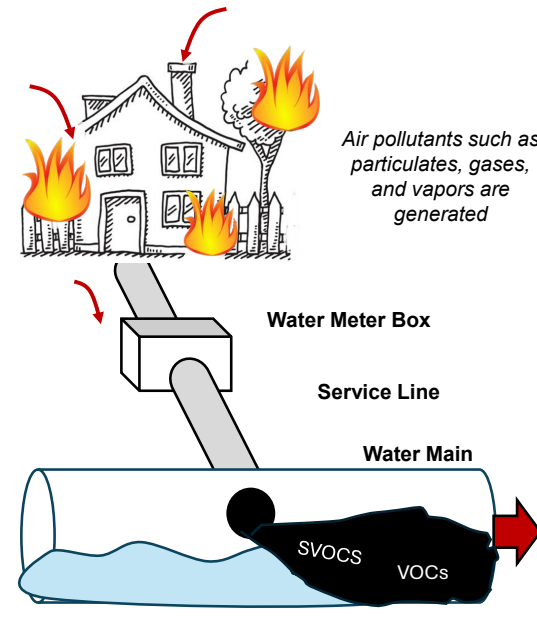
Safe water is critical health, safety, and economic security

Major Fire Impacts: Power loss, pressure loss, and contamination rendering infrastructure and water unsafe to use

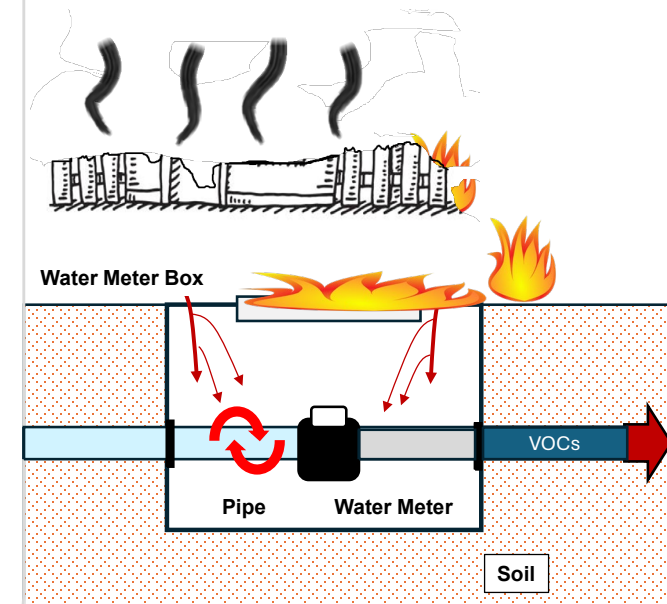
(a) Burning or smoldering vegetation and other materials nearby traveling in ambient air



(b) Burning or smoldering of structures traveling through the water service line



(c) In-situ thermally degraded plastics due to fire effects



Zavodny & Whelton. 2026. Water utilities damaged by wildfire: Recovery lessons, mitigation, and research needs. *Utilities Policy*. (Forthcoming: <https://www.doi.org/10.1016/j.jup.2026.102245>)



California · Colorado · Hawai'i · New Mexico · Oregon : 2017 Tubbs Fire · 2018 Camp Fire · 2020 Bear Fire · 2020 Oregon Fires · 2021 Marshall Fire · 2021 Lytton Fire · 2022 CC/HP Fire · 2023 Maui Wildfires · 2025 Los Angeles Fires

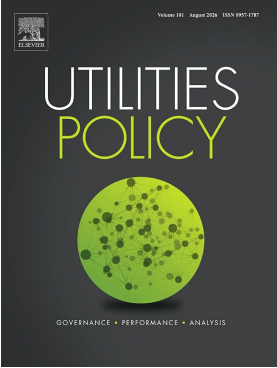
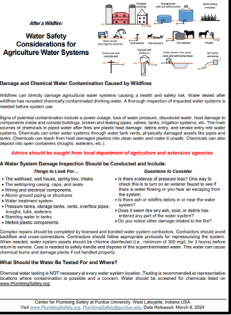
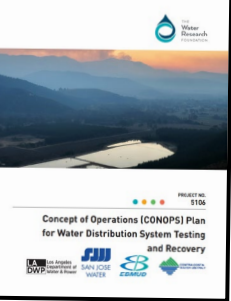
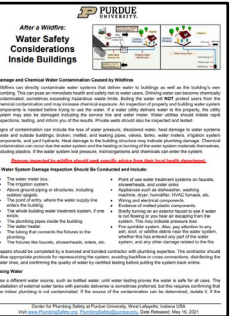
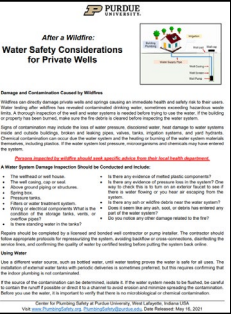
On Safe Drinking Water: Today and much of the past

Focus on hazard identification, extent of damage, sources and pathways of contamination, exposure

Support rapid decisions to lessen impacts: Water utilities, Purdue University, Oregon State University, UC Davis, private consulting companies, Deakin Univ., Melbourne Univ.

SOLUTIONS

- Concept of Operations Plan (CONOPS) for reducing impacts....
Adopted by 11 utilities after 2025 L.A. Fires.
- Guidance for private wells and springs
- Guidance for impacted plumbing
- Guidance for agricultural water systems



Now, a **NEW STUDY**
Forthcoming

GOAL: Identify mitigation strategies to reduce fire impacts on water utilities and policies that can accelerate recovery.

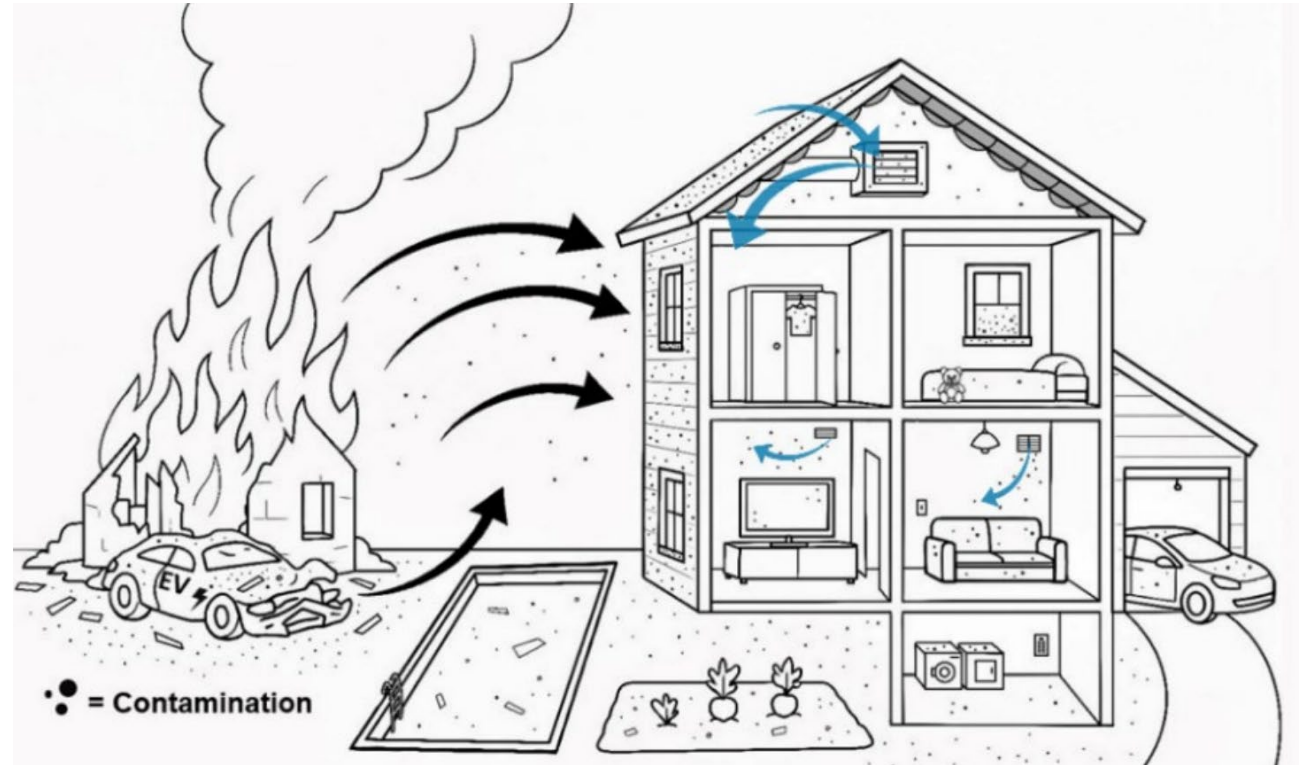
Focus on U.S. utilities (infrastructure defense, workforce, rebuilding, finances), with comparison to Canadian and Australian experiences.

RESULTS: Mitigation actions are available to improve pre-fire system operations, system design, adoption of new technologies

- ✓ Enable continued firefighting
- ✓ Lessen water loss
- ✓ Lessen potential for system contamination
- ✓ Lessen the possibility of chemical exposure
- ✓ Lessen recovery time and cost
- ✓ Identify actions to expedite rebuilding and recovery

Innovation opportunities abound to better understand and reduce health impacts: Systems coordination, research, and recovery innovation

Drinking water systems
Wastewater systems
Stormwater systems
Public spaces – Parks, beaches
Private spaces – Property
Debris and soil
Outdoor air
Swimming pools
Gardens
Indoor building environments
Agriculture



Whelton, A.J., Bollens, E., Ferrarezzi, C. After a Wildfire: Considerations for Building Environmental Testing. September 2025. West Lafayette, Indiana USA.
10.5703/1288284317911

Some ongoing work:

Systems coordination, research, and recovery innovation

1. **The HEART Study: Health-based Environmental Assessment and Re-Occupancy Testing** – Evidence-based practices for safely restoring homes after a fire.
2. **The ASHES Study: Fire Ash and Soil History Evaluation** – Evidence-based practices for safely returning property soil to pre-fire condition.
3. **The REBUILD Survey: Recovery Efforts By Uniting Individuals, Listening, and Discovery** – Opportunities to improve household experiences with evacuation, housing, environmental testing, chemical exposures, insurance, and rebuilding.
4. **The L.A. Pools Study** – Evidence-based practices for restoring wildfire impacted swimming pools.
5. **The CRIBS Study: Chemical Risk In Baby Product Sorption** – Evidence-based guidance on handling baby products exposed to contaminated drinking water.
6. **Mitigation Actions to Improve Water Utility Fire Resilience** – Evidence-based practices and technologies to reduce impacts and expedite recovery.

Collaborators and Partners:

Community groups

Property owners

Parents

Water utilities

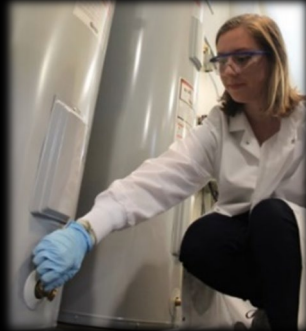
Universities

Companies

Foundations

Other efforts in the works

Thank you



Visit our wildfire response and recovery resources page at www.PlumbingSafety.org

- ✓ Post-fire chemicals to test for
- ✓ Brief videos for emergency managers and health officials
- ✓ Guidance for private well owners
- ✓ Guidance for building owners
- ✓ Government agency resources
- ✓ Guidance for consultants
- ✓ Utility decision CONOPS
- ✓ FEMA mitigation guidance
- ✓ Other training resources

Special thanks to...



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Andrew Whelton's Wallet

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