Economic costs of wildfires: Informing cost accounting, community resilience, and planning

Evan E. Hjerpe, Gwendolyn Aldrich, Melanie M. Colavito, and Andrew Sánchez Meador

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Understanding Wildfire Costs

Adapting to the rapidly escalating scale of wildfire impacts necessitates an improved understanding of the economic costs of wildfires. However, our understanding of the scale and trends in wildfire costs remains incomplete and underestimated, as the impacts of wildfires are constantly growing and changing, cost accounting is often published before long-term costs materialize, and many wildfire costs are difficult to measure.

A thorough review of published wildfire cost studies was used to develop a comprehensive and consistent wildfire cost categorization structure, which was then applied to 131 individual wildfire costs published in studies of 29 US wildfires. A subsequent meta-analysis of the categorized costs provides magnitude estimates for each of nine different wildfire cost types. The research results improve our understanding of potential wildfire cost types and amounts and thereby support more effective community resilience planning.

Economic costs of wildfire. The figure depicts the chronological order of costs (left to right) as well as the typical order of prevalence in documentation. Subsequent post-fire flooding can cause similar types of damages.

Key Findings

- For larger wildfires, damages to the built environment tend to be the most expensive type of wildfire cost, followed by suppression and ecosystem service costs.
- Wildfire cost analyses have missed important costs, especially concerning human health, ecosystem services, and market impacts. For example, we found no smoke-exposure cost estimates for individual wildfires.
- Recent, large, human-caused wildfires tend to be the costliest, driven by proximity to communities, the wildland-urban interface (WUI), and other at-risk assets.
- Post-wildfire flooding can be a subsequent natural disaster that generates economic costs across all cost categories, with impacts that tend to exceed those of the wildfire itself.

Management Implications

- Before wildfires occur, communities can improve wildfire planning and preparedness by identifying regional assets and values at risk and matching them to wildfire cost categories and estimated amounts.
- After wildfires, communities can use wildfire cost categories and amounts to index full-cost accounting for region-specific damage inventories, emergency declarations, financial assistance, and legal purposes.
- Pre-suppression activities, like fuel treatments, can avoid and lessen wildfire costs. Predictive wildfire costs can be used to more accurately measure the benefits of fuel treatments.
- Greater attention should be given to resilience efforts that can mitigate the economic costs of wildfires, such as pre-suppression fuel treatments, home and infrastructure hardening, creating defensible space, and community education and awareness.

This fact sheet summarizes information from the following paper:

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Contact: Evan Hjerpe, evan@conservationecon.org

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