Understanding Climate Risks and Building Climate Resilience in Mobile Home Communities

by Skye Niles and Katie Clifford, Western Water Assessment

Introduction

Mobile homes represent an important source of affordable housing across the United States, representing about 6% of the U.S. housing stock, and over 20 million residents (Sullivan 2018). In Colorado, there are over 700 mobile home parks.

The cost of a mobile home is approximately half the cost of conventional housing, and affords the privacy of a detached home, rather than the shared walls of apartment or townhome dwelling. Further, mobile homes are unsubsidized affordable housing – meaning that residents do not need to go through the often years-long waiting process of applying for government-subsidized affordable housing (Sullivan 2018).

However, mobile home park (MHP) residents may be at heightened vulnerability to the impacts of climate-related risks due to the distinct infrastructure of mobile homes, as well as financial, political, and social factors impacting MHP residents (Kear et al. 2023; Phillips et al. 2021; Rumbach et al. 2020).

Lyons Colorado, after 2013 Colorado Floods. Photo Credit: AP News.

Divided Ownership – A Unique Concern of Mobile Home Park Communities

Mobile homes represent a unique form of housing because residents of mobile homes often *own* their home, but *rent* the land on which their home sits. What this means is that mobile home owners must comply with mobile home park rules and regulations, which might include restrictions on modifications to home structures (including shade structures to protect against heat) or cutting back of trees.

If residents complain about park conditions or rules, they may risk retaliation from park owners, including predatory rent increases, or threats of eviction.

Despite the name "mobile" home, most mobile homes are not able to be moved, due to the infrastructure being too weak to be able to withstand transit. Over 80% of mobile homes are never moved from their original installation (Sullivan 2018). This means residents have few choices in response to landlord decisions.

Heat and Wildfires are Growing Concerns for Colorado Mobile Home Residents

Two of the pressing, intersecting climate concerns in Colorado are **extreme heat** and the **air quality impacts of wildfire smoke.** Both are expected to increase and carry significant health impacts and risk of death (Bolinger et al. 2024; Wong et al. 2013). Wildfire smoke episodes often occur during hot summer months; thus, the intersection of heat and smoke represents an important, compound hazard, but not everyone faces these risks equally. Socially vulnerable populations—including MHP residents—face heightened exposure and consequences of climate hazards (Cutter et al. 2003).

Wildfires Risks in Mobile Home Parks

MH residents are particularly vulnerable to wildfires:

- Exposure in the WUI: MHs are disproportionately located in areas with high wildfire risk, compared to other housing types (Pierce et al. 2022).
- Smoke: Older MHs are often less well insulated and have issues with windows leaking that can expose them to higher levels of smoke.
- Evacuation: MHs are sometimes referred to as "matchstick houses" due to being constructed with highly flammable materials. Further, many are constructed in a way that limits easy evacuation routes or access of emergency vehicles (MacTavish et al. 2006).

Extreme heat is a growing concern for Colorado mobile home residents. Photo Credit: Washington Post.

Extreme Heat Risks in MHPs

MHP residents are highly vulnerable to extreme heat:

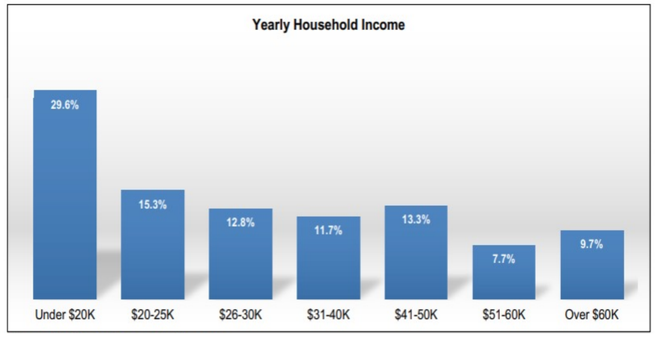
- Vulnerable populations: Residents are disproportionately comprised of populations who are more vulnerable to heat stress, such as people with disabilities, and people over the age of 65.
- High death rates: In Maricopa County, AZ, 30% of all heat related deaths in the area occurred in mobile homes (MCDPH 2021).

Intersecting Social and Physical Vulnerabilities

Intersecting social and physical factors contribute to MHP residents facing heightened climate risks for **extreme heat and wildfire smoke.** The interaction between heat and air quality risks creates a compound hazard. During air quality events, federal standards advise residents to stay indoors with windows closed (EPA 2024). However, for MHP residents without air conditioning, closing their windows during air quality events may exacerbate extreme heat indoors, leaving residents in a catch-22 where they can only protect themselves against one of two hazards.

Physical	Social
Lack AC/cooling infrastructure	Low income
Lack of insulation	Language barriers
Older homes that need updates	Stigmatized population
Low shade cover and canopy	Disproportionately serve minorities
Flammable materials	High pop disabled and elderly
High density (fire spread)	Policy gaps

These heat and smoke climate risks are also magnified by the **social vulnerability** of MHP residents. A recent survey of Boulder County MHP residents showed that 30% live on total household annual incomes of less than $20,000 (Fluri 2023).



Annual Household Income of Boulder County MH Residents, Credit: CU BAHRI Mobile Home Survey 2024.

Research Questions

This research asks:

1) What are the physical heat and wildfire smoke air quality hazards within mobile homes in Colorado mobile home parks (MHPs)?
2) How do MHP residents experience and adapt to the compounding effects of extreme heat and wildfire smoke, and other climate related hazards?
3) How do unique factors of MHPs—including home structure, distinct land tenure and zoning policies, and social vulnerabilities—shape climate risk and adaptation efforts?

New Funding: CIRES 2024 IRP!!

Thanks to funding from the CIRES Innovative Research Program, this project is able to take on a novel, interdisciplinary, mixed methods approach. In addition to in-depth case study research, we will also be piloting low-cost sensors to monitor heat and air quality hazards within the home.

Research Methods

Our research uses a mixed methods approach to understanding climate risks in mobile home communities, integrating both qualitative and quantitative methods.

- We will install low-cost heat and air quality sensors to measure MHP residents' exposure to extreme temperatures and wildfire smoke inside their homes and within the outdoor areas in their MHP.
- We will also conduct in-depth interviews with MHP residents to provide qualitative data to understand how residents experience and adapt to the compound climate hazards of heat and wildfire smoke, and other climate risks.

Together, these two lines of inquiry will shed light on the climate risks specific to MHP communities, and what policies and practices can help increase climate resilience.

Intended Community Impacts:

- Support new state legislation being developed to improve climate resilience (e.g., Mobile Home Bill of Rights)
- Understand unique climate risks to MHPs and how they impact residents
- Document policy gaps or loopholes that leave out MHP residents from state support
- Quantify heat and smoke differences between homes
- Partner with state agencies, NGOs, local governments, and residents

Questions? Comments? Ideas?

Please reach out to:

- Skye Niles (skye.niles@colorado.edu)
- Katie Clifford (katie.clifford@colorado.edu)