

Climate Change-Induced Extreme Heat and Wildfires Dampen Migration in U.S. Regions with Natural Amenities

For decades, people moved to U.S. counties rich in natural amenities and outdoor recreation, but as climate change increases extreme heat and wildfires, that migration is slowing down. Richelle Winkler and Mark Rouleau of Michigan Technological University say their findings can help policymakers and planners anticipate climate change's impact on where people migrate. Rural counties with outdoor recreation and environmental features like sunshine, dramatic topography, warm and dry climate, and forests are most affected by these migration shifts.

The research team used data from the Internal Revenue Service (IRS) based on address changes in tax filings to track annual migration flows from 1990 to 2015 for all U.S. counties. Winkler and Rouleau combined the data with weather records on changes in extreme heat and wildfire disaster declarations from the Federal Emergency Management Agency (FEMA). They statistically tested relationships between abnormal extreme heat or wildfire events and migration responses a year later, while controlling for economic and other factors that impact migration.

Their results show that U.S. counties lost four migrants per 10,000 residents for each additional 10 days of experiencing abnormal extreme heat. The changes come from fewer people moving into counties with more extreme heat and more people leaving these counties. Counties that experienced a wildfire disaster saw an average net reduction of 32 migrants per 10,000 the following year, mostly due to more people leaving. Wildfire impacts extended to neighboring counties, which saw a net reduction of 18 migrants per 10,000, perhaps because of smoke effects. Bigger fires impacting larger regions were associated with reduced in-migration as well as increased out-migration, perhaps due to increased press coverage.

Impacts were greater in rural counties and especially in counties with more environmental amenities and outdoor recreation opportunities. Here, for every 10 days of extreme heat, the counties lost seven to eight people per 10,000, which is a 75% greater impact than in counties overall. Wildfire in the previous year reduced net migrants by 45 per 10,000 in high-recreation counties.

For many decades, Americans generally moved away from the Northeast and Midwest toward the South and West, regions now susceptible to more extreme heat and wildfire. This study shows that environmental amenities like sunshine, mountain landscapes, or forests that tend to attract migrants to particular places can shift to become disamenities when they lead to increased susceptibility to wildfire and extreme heat or other negative climatic events not examined in this study like hurricanes, drought, or coastal sea-level rise. Policymakers and planners currently rely on migration models that predict more people moving to counties rich in environmental amenities. These models need to reconsider how climate change is likely to alter migration trends, which can then impact economic development and communities' ability to plan for the future.

Journal Article: Richelle L. Winkler and Mark D. Rouleau “Amenities or Disamenities? Estimating the Impacts of Extreme Heat and Wildfire on Domestic US Migration,” *Population and Environment* 42, no. 4 (2021), <https://doi.org/10.1007/s11111-020-00364-4>.