

Idaho Climate-Economy Impacts Assessment

Snapshot: Smoke

Air Quality, Smoke, and Wildfires

A variety of sources contribute to air quality, such as exhaust from vehicles, emissions from industries, dust from dry conditions, pollen, and smoke from wildfires. Air quality is impacted by elevation, humidity, precipitation, and temperature. Air quality is measured by the U.S. Environmental Protection Agency (EPA) on a scale from good (0-50) to hazardous (301+).

Two main factors contribute to poor air quality in Idaho:

1. In cold months, local air pollutants, such as carbon monoxide from vehicles or industrial facilities and smoke from fireplaces, get trapped in valleys and low-lying areas.
2. In warm months, wildfires across the region emit large quantities of pollutants. Among wildfire-caused air pollutants, small particulate matter (PM2.5) is long-lived, can be transported thousands of miles, and is a major health threat.

Over the past four decades, wildfire activity has increased significantly across Idaho and the western U.S., producing smoke that blankets the region with poor air quality. While smoke forecasts help Idahoans prepare for wildfire smoke, Idaho remains vulnerable to economic risks and adverse health impacts associated with increased smoke.

Economic Impacts of Smoke

From 2008 to 2012, it is estimated that western wildfire smoke hospitalized 5,200-8,500 people, and killed up to 500 people per year in the west. The cost of short-term exposure to this smoke was \$11-\$20 billion per year. Long-term exposure costs were estimated to be \$76-\$130 billion per year. These negative health and economic effects are expected to increase with longer and more intense fire seasons.

Wildfire Smoke Impacts Idaho's Economic Sectors

Smoke-related economic damage to Idaho could reach millions of dollars per year. A few examples of economic impacts due to smoke:



Agriculture

Crop damage, slower crop growth, and impacts to livestock, such as reduced milk production.



Land

Burned areas in the inland Northwest will likely increase 2-3 times their current size by 2050.



Energy

Solar energy production can be reduced by as much as 30% during smoke events.



Infrastructure

Changes to hospital usage, reallocation of hospital resources, increasing need for air filtration systems, and reductions in outdoor labor productivity and wages.



Human Health

Increase in the number of smoke-related illnesses, including an estimated doubling of premature deaths due to smoke by 2100.



Recreation & Tourism

Decreases in tourism during fire season due to unhealthy air quality and fire activity.

Wildfire Smoke Impacts Idahoans' Health

Idahoans are at risk for illnesses associated with wildfire smoke. Vulnerable populations, including elderly, youth, those without adequate air filtration systems, and those with chronic conditions, such as asthma, heart disease, and chronic obstructive pulmonary disease (COPD), are at higher risk. Idahoans who spend a lot of time outdoors are also at increased risk for developing and worsening the following:

Asthma attacks	Wheezing and shortness of breath
Chest pain	Fatigue
Coughing	Headaches
Rapid heartbeat	Irritated sinuses
Stinging eyes	

As the fire season lengthens, smoke exposure and health risks increase. Idaho is expected to be among the highest risk states for wildfire smoke in the western U.S. by mid-century.

Idaho is at High Smoke Risk

Across the western U.S., PM2.5 levels from wildfire smoke, a major contributor to unhealthy air quality, are projected to increase over 150% by 2050. The Fire Smoke Risk Index, a measure combining smoke wave duration, intensity, and frequency, projects that most Idaho counties will shift to very high smoke risk by 2050 (shaded red). Map A to the right displays the fire smoke risk at the county level from 2004 to 2009. Map B is the future (2046-2051) fire smoke risk for Idaho counties.

Data source: Liu et al. 2016, most comprehensive recent data comparing past and future smoke risk.

PAST AND FUTURE SMOKE RISK

Fire Smoke Risk Index

1
(low risk)

2

3

4

5
(high risk)

A

Past Fire Smoke Risk
2004-2009

B

Projected Fire Smoke Risk
2046-2051

Interested in learning more about wildfire smoke and Idaho's economy?

For further information, resources, tools, references, and additional reports, please visit www.uidaho.edu/iceia

VIEW MORE SNAPSHOTS:

- Agriculture
- Climate
- Energy
- Forests
- Human Health
- Infrastructure
- Rangelands
- Recreation & Tourism
- Smoke
- Water

Page 2