



Emergency Preparedness and Response to Climate Change: The Role of the Environmental Health Professional

The National Environmental Health Association (NEHA) aims to raise awareness of the impacts of climate change. These changes, including the effects of extreme weather events on infrastructure and human health, have increased the need for preparedness and response across every sector of public health, especially environmental health (EH). EH professionals play an integral role in mitigation, preparedness, response, and recovery. Clearly, NEHA's mission, *to advance the environmental health professional for the purpose of providing a healthful environment for all*.

Climate change is the greatest threat to global health.⁸ It affects human health through air quality, extreme heat, drought, wildfires, extreme storms, floods, vector borne illnesses, and changing local weather patterns.

Though global, the effects of climate change are inherently local. All people are susceptible to physical and mental health impacts; however, certain groups carry a heavier burden. These populations include children, people of color, older adults, people with disabilities, and people in impoverished communities.

! FAST FACTS !

ONE-THIRD of the U.S. population lives in the most vulnerable areas to wildfires.³

209 FIREFIGHTER DEATHS due to wildland fires from 2011-2015.⁹

14 OF CALIFORNIA'S 20 largest wildfires have all burned since 2000.²

One of the health effects of wildfire smoke exposure, asthma, causes **14 MILLION LOST SCHOOL** days each year.⁸

Wildfire ash contains pesticides, propane, gasoline, lead, plastic, and paint. These chemicals **POSE A DANGEROUS THREAT** to the health of communities and farming productivity.⁷




The Thomas Fire burned over **440 SQUARE MILES** of land and 23 fatalities, making it the largest wildfire in California's history.¹⁰

WILDFIRES HARM HEALTH

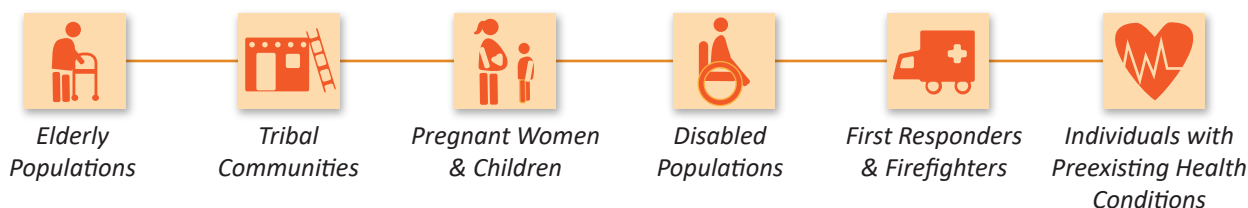
Climate change is causing excessive periods of drought and higher temperatures, which increases the frequency, intensity, and seasonal duration of wildfires. Wildfires continue to demolish communities through fire, erosion, flooding, and poor air quality. Following these devastating events, smoke and wildfire ash contribute to an increase in ozone and particulate matter that pose a serious health risk.

Wildfires can affect many aspects of human health, including:

- Wildfire smoke, which is a complex mixture of carbon dioxide, carbon monoxide, particulate matter, hydrocarbons, nitrogen oxides, and hundreds more contaminants⁴ can cause respiratory illnesses, adverse reproductive and developmental effects, and premature death
- Exposure to firefighting foam, which contains harmful chemicals called polyfluoroalkyl substances (PFAs and PFOs), can increase liver enzymes, decrease vaccination response, cause thyroid disorders, and cancer⁶
- Wildfire destruction contaminates air, water, and soil through burned building materials. Contaminants include asbestos, formaldehyde, and phthalates, and contact can cause nerve damage, swelling in the eyes and throat, and alter the human hormone system¹²
- Infrastructure damages from a wildfire increase mental health effects from trauma and property loss, destroyed roads, and reduced access to health services, including hospitals and pharmacies

	 AIR	 WATER	 SOIL
Wildfire Impacts	Carbon dioxide and monoxide, particulate matter and ground level ozone reduce air quality	Water contamination from burning of materials and settling into fresh water streams	Soil contamination from ash and increase of storm water runoff
Health Outcomes	Trigger heart and lung disease	Increased liver enzymes, thyroid disorders, pregnancy-induced hypertension, and adverse reproduction and developmental effects	Abdominal pain, nausea, dizziness, headache and premature death
EH Workforce Role	Monitor and regulate wildfire smoke	Educate and respond following a disaster through alerts and water testing	Test soil and monitor farm lands that may be contaminated by wildfire ash

POPULATIONS VULNERABLE TO WILDFIRES





ENVIRONMENTAL HEALTH WORKFORCE ROLE

The increased frequency and intensity of wildfires has increased the need for wildfire preparedness and response. In addition to frequency, wildfires have spread to areas that historically were not wildfire prone. EH professionals play an essential role in helping communities to prepare for wildfires, educate the communities on health threats, examine environmental contamination, and assist in the recovery.

In order to address the health threats of wildfires and smoke, EH professionals must be able to:

- Investigate and assess hazardous air pollution agents during and after a wildfire event. Notify the local community of hazardous air quality
- Provide recommendations, interventions, and policies on wildfire hazards. From prevention to response, leadership is needed in these efforts
- Maintain air pollution monitoring systems and track where wildfires take place and where monitors are located
- Test for wildfire contaminants in water, air and soil throughout the community
- Facilitate cross-sectoral engagement including community members, air pollution control districts, climate change coalitions, and industry to gain insight and support from these local leaders on wildfires in the community and the effects on health
- Understand the impact that systems, social and structural inequities, institutional power and structural racism can have on climate change

EH professionals are uniquely qualified to respond to wildfire impacts due to their in-depth knowledge of the relationship between health and the environment. Local health departments can assess, survey and educate vulnerable communities, collaborate with community-based organizations, and prepare for future wildfire events.⁷



RECOMMENDATIONS

- EH organizations should support work to mitigate climate impact by reducing greenhouse gas emissions, prevent wildfires and enforcing air quality regulations.
- Health departments should support efforts to create air pollution policies and forge partnerships that assure equitable access to clean air.
- Health departments should utilize CDC's Building Resilience Against Climate Effects (BRACE) Framework to estimate the burden of health outcomes and vulnerabilities associated with



WILDFIRES



ASSESSMENT

EH professionals identify, assess, and help recommend solutions for air, water, and soil contamination vulnerabilities.

- Assess local wildfire trends and investigate current community health needs. For example, monitoring daily air quality from wildfire smoke, local wind patterns, and what is causing it.
- Analyze air, water, and soil quality for contaminants from burning building material and fire extinguishing foam. Monitor the contaminants and the effect on health by identifying causal factors and following up through planning interventions for vulnerable communities.

POLICY DEVELOPMENT

EH professionals must support community efforts to address wildfire outcomes through policy preparedness.

- Weave wildfire adaption into current organizational structures by emphasizing the hazardous effects of wildfires to improve human health outcomes.
- Plan evacuation policies that include an alert system, as well as safe evacuation means for communities at risk. The policy would involve local preparedness and response teams, as well as local health officials, to provide knowledge and consistency for communities.

ASSURANCE

EH professionals have an essential role in protecting community health from wildfires by ensuring local air pollution preparedness, active wildfire plans and recovery actions.

- Include all media forms to alert the public of poor air quality and local wildfire dangers, such as phone, social media, television, and print media.
- Educate local community members on the cardiovascular and respiratory risks and threats to the exposure of wildfires, smoke, ash and firefighting foam.

exposure to poor air, water, and soil quality from wildfires.

- Academic EH programs should develop a highly skilled and well-trained workforce in monitoring wildfires and developing evacuation plans.
- EH professionals should undergo the Environmental Health Training in Emergency Response (EHTER); Awareness Level to focus on the role of EH responders to prepare for, respond to, and recover from air pollution emergencies and Operations Level involves hands-on operation practice and response to simulated events.

Resources

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