



## EXTREME STORMS



## 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.<sup>8</sup> 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 !

Heavy precipitation events that previously occurred every 20 years are now expected to occur every **12 YEARS** in the Southwestern U.S. and every **15 YEARS** in the Northwestern U.S.<sup>4</sup>

Total rainfall is expected to **INCREASE BY OVER 30%.**<sup>2</sup>

In New York and New Jersey, Hurricane Sandy led to **273 PREMATURE DEATHS**, 6,602 hospital admissions, and \$3.1 billion in total health costs.<sup>3</sup>

The maximum wind speeds of tropical storms are expected to **RISE BY 11%** by the end of the 21st century.<sup>2</sup>

More than **26 MILLION** were affected by disasters between 1980 and 2010 due to natural catastrophes. These events collectively caused more than \$544 billion in damage costs or roughly \$17.5 billion per year during the 30-year period.<sup>2</sup>

### CLIMATE CHANGE AND EXTREME STORMS

Since warmer air can hold more water vapor, more moisture available to fuel storms, causing heavier rainfall. As the sea surface temperature increases, the intensity, frequency, and duration of hurricanes has also increased. Over the last several decades tornadoes have become more powerful, with higher damage ratings and wider paths of destruction than previously measured. Extreme storms can affect many aspects of human health. For example:

- Floods, intense winds, and strong currents from extreme storms can put people at risk of injuries, drowning, or death
- During extreme storms, floodwaters can contaminate the drinking water supply

- Respiratory and cardiovascular illness, waterborne diseases, and food contamination
- Infrastructure damages from extreme storms increase mental health effects from trauma and property loss, destroy roads, and limit access to supporting health services
- Crops and food supplies can be damaged or lost
- Standing water after storms can lead to increased vectors, mold and contamination issues

Health effects caused by extreme storms contribute to school and work absences as well as decreased productivity.

#### EXTREME WEATHER CAN LOOK VERY DIFFERENT



Tornados



Thunderstorms



Wind Storms



Extreme Cold



Hurricanes



Blizzards

### HEALTH IMPACTS

- Mold exposure causing respirator illness
- Hypothermia or frostbite
- Food and waterborne illness
- Drowning
- Increases mental health effects from trauma and property loss
- Destroy roads and limits access to supporting health services
- Injury
- Death

### ENVIRONMENTAL HEALTH WORKFORCE ROLE

- Provide recommendations to protect health against hazards
- Protect against hazardous contaminants
- Monitoring weather systems and wind patterns
- Notify the public of severe weather events
- Interpret extreme storm and health research utilizing science

### POPULATIONS SENSITIVE TO EXTREME WEATHER



Disabled Populations



Tribal Communities



Preexisting Health Conditions



Children



Impoverished Communities



Elderly Populations



## ENVIRONMENTAL HEALTH WORKFORCE ROLE

EH professionals play an essential role in prevention, disaster recovery efforts, and reducing public health risks of poor air and water quality exposure. Extreme storms increase the need for preparedness and response from EH professionals. An EH professional who specializes in severe storm response has the appropriate education and training needed to support local extreme weather impacts and protect human health.

In order to address the health threats of extreme storms, EH professionals must be able to:

- Investigate and assess hazardous pollution agents that can contaminate water, air and soil
- Provide recommendations, interventions, and policies to protect and control water and soil hazards to health following a severe storm event
- Notify the public of severe weather events and develop evacuation plans with sheltering options, boil water orders and local partners to assist during the severe weather
- Facilitate cross-sectoral engagement including community members, climate change coalitions, and industry to gain insight and support from these local leaders
- Interpret extreme storm and health research utilizing science and understand the impact on health outcomes
- Provide recommendations to residents on how to prepare for and recover from disasters
- Providing education to both residents and businesses, including restaurants, on food safety after a disaster
- 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 extreme storm impacts due to their in-depth knowledge of the relationship between severe weather, health, and the environment.



## RECOMMENDATIONS

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

### Resources

- 1 Dettinger, M., Udall, B., & Georgakakos, A. (n.d.). Western water and climate change. Western water and climate change (Vol. 27, pp. 1024–1024). Ecological Applications. Retrieved from <https://esajournals.onlinelibrary.wiley.com/doi/10.1890/15-0938.1>
- 2 Writers, S. (2019, September 23). Climate Change - Extreme Weather. Retrieved from <https://www.publichealth.org/public-awareness/climate-change/extreme-weather/>
- 3 Limaye, V., Max, W., Constable, J. and Knowlton, K., 2019. Estimating The Health-Related Costs Of 10



## EXTREME STORMS



### ASSESSMENT

EH professionals identify, assess, and help recommend solutions for extreme storm vulnerabilities.

- Assess local weather and temperature data and investigate current community health needs by identifying environmental hazards and the effect on human health; for example, monitoring daily severe weather and what is causing it; tropical storms or temperature changes.

### POLICY DEVELOPMENT

EH professionals support community efforts to address extreme storms through policy.

- Weave climate and extreme storm adaption into community design plans to adjust to current climate change conditions and mitigation policies to reduce flooding, injuries, and fatalities.
- The Pandemic and All-Hazards Preparedness Act of 2019 (PAHPA) was recently signed to sustain and strengthen the nation's preparedness for public health emergencies. The new revision now specifically identifies EH professionals as an essential contributor to emergency preparedness.

### ASSURANCE

EH professionals have an important role in protecting the health of the public by ensuring local extreme storm preparedness, management and evacuation plans, and recovery actions.

- Include all forms of media to alert the public of extreme storms, such as phone, social media, television, and print media. In addition to numerous media outlets, providing different resources in different languages is essential.
- Maintain key infrastructure features through multidisciplinary partnerships with civil engineers or urban planners.

- Academic EH programs should develop a highly skilled and well-trained workforce to develop evacuation and communication plans.
- Health departments should develop EH Strike Teams to prepare and establish a plan for future disasters.
- EH professionals should undergo the Environmental Health Training in Emergency Response (EHTER) training. The Awareness Level training focuses on EH responders' role to prepare for, respond to, and recover from air pollution emergencies, and the Operations Level involves hands-on operation practice and response to simulated events.

- Climate-Sensitive U.S. Events During 2012. [online] Advancing Earth and Space Science. Available at: <https://doi.org/10.1029/2019GH000202> [Accessed 2 September 2020].
- 4 Jackson, R., 2020. The Effects Of Climate Change. [online] Climate Change: Vital Signs of the Planet. Available at: <https://climate.nasa.gov/effects/> [Accessed 2 September 2020].
- 5 "WHO Calls for Urgent Action to Protect Health from Climate Change – Sign the Call." World Health Organization, World Health Organization, 14 Apr. 2016, [www.who.int/globalchange/global-campaign/cop21/en/](http://www.who.int/globalchange/global-campaign/cop21/en/).