

URBAN FLOODING: Hazards and Tips for Prevention



Flooding in urban areas has become more common due to the rising number of hurricanes and other extreme weather events. These flooding events are linked to high rates of rainfall that overwhelm urban systems' capacity for excess water.

Flooding events can be extremely dangerous, especially fast-moving water that rapidly fills streets, homes, and buildings before people can safely evacuate. Some urban communities experience repeated flooding events which can be stressful for homeowners due to the financial strain, emotional stress, and hardships of temporarily living in a damaged home.

Cleanup and repairs after flooding can expose people to a variety of hazards, all of which can be avoided. This fact sheet provides some tips to help workers and homeowners protect themselves during or after urban flooding events.



What health hazards should I be aware of during or after a flood?

Structural hazards:

- **Trauma** from tripping, falling, stepping on sharp objects, and using chainsaws. **Broken bones, severe head injuries, and lacerations** may be caused by falling debris from unstable structures, nails, working on ladders, or improper use of equipment.
- **Burns and electrocution** from live electrical wires. The burns and damage from electricity can cause severe tissue damage and even death.

Harmful exposures:

- **Carbon monoxide** in the air when using gas powered equipment indoors, such as power washers, without good ventilation. Carbon monoxide poisoning can lead to serious medical problems and death.
- **Infectious agents** carried in contaminated floodwater. Sewage backups can contaminate floodwaters which collect in structures below the ground. This water may contact open wounds, causing skin infections, or be swallowed accidentally, causing vomiting or diarrhea.
- **Mold** can lead to or worsen lung health issues like asthma and chronic obstructive pulmonary disease. Chronic, unresolved moisture can lead to mold growth on walls and furniture in flooded spaces. Mold spores can spread in the air and be breathed in when cleaning spaces.
- **Toxic chemicals**, like gasoline, oil, or industrial toxins can cause skin irritation or other problems if swallowed.



What can be done to prevent these hazards?

Tips to avoid structural hazards and harmful exposures:

- Never enter moving floodwaters.
- Never operate gas powered equipment indoors.
- Never operate a generator indoors or near open windows or doors.
- Avoid exposure to floodwaters.
 - Wash exposed skin frequently.
 - Clean and cover any exposed or open wounds.
- Always ensure that power is turned off before entering any flooded area and avoid touching any exposed electrical lines.
 - Only use equipment that is approved for use in water.
- Make sure your home is safe to enter after any flooding event. Floodwaters can damage the foundation and cause structural damage that makes a building unsafe to enter.
- Carefully check for snakes, venomous insects, and wild animals sheltering in your home. Notify animal control for removal of stray pets or wild animals.
- Be aware of the temperature.
 - If you are working in the cold, dress appropriately and take warming breaks. Change wet clothes frequently, especially shoes, boots, and socks.
 - If you are working in the heat, take cooling breaks and stay well hydrated.

Tips for repairs

- If you are hiring contractors to repair your home, seek references and make sure they have a license.
- Be wary of unlicensed or predatory contractors. Contact your insurance company or local building inspector officials if you have any questions.
- If you are doing the repairs yourself, make sure you can perform the work safely and are able to operate any necessary equipment.
- If working with ladders, secure them properly and have a spotter hold the ladder while you are working on it.
- Look for contacts of any state or federal assistance centers to get information about financial assistance that may be available to you.



PERSONAL PROTECTIVE EQUIPMENT | *At a minimum you should have and use:*



PROTECTIVE EYEWEAR
Safety goggles.



GLOVES
Rubber gloves for working in wet conditions and leather gloves for working in dry conditions.



FOOTWEAR
Hard-soled shoes to prevent puncture wounds. Rubber/waterproof boots for use in wet areas.



RESPIRATORS
N95 and elastomeric respirators are best but must be tight fitting. Surgical/cloth masks filter large particles but are not as good as an N95 or elastomeric respirator.



PROTECTIVE OUTERWEAR
Coveralls or fishing waders if working in deep floodwater.

LINKS AND RESOURCES:

NIEHS Worker Training Program (WTP) National Clearinghouse for Worker Safety and Health Training:
<https://tools.niehs.nih.gov/wetp/>

NIEHS WTP Hurricanes and Floods Training Tools: <https://tools.niehs.nih.gov/wetp/index.cfm?id=2472>