

# KEEPING MOLD AT BAY

PROACTIVE PLANNING AND RECOVERY STEPS  
FOR FLOODS AND OTHER NATURAL DISASTERS

Surviving a natural disaster is often a miracle in and of itself. Not only do affected residents have to be careful to avoid harm during the initial devastation, their vigilance must continue throughout the aftermath when many significant health and safety issues exist.





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It's crucial to avoid contact with flood waters as they may contain dangerous contaminants including bacteria, viruses, fuel oils, pesticides, raw sewage, heavy metals, chemicals from any flooded superfund sites, and even animal carcasses. Residents and volunteers also need to be aware of other possible hazards such as electrical shock from wet or downed wires, asphyxiation from leaking gas lines, carbon monoxide poisoning from generator fumes leaking indoors, bites from snakes, rats, and other varmints ... you get the idea.

Contact with flood waters is not the only potential risk to health after a natural disaster. "Unfortunately, once the floodwaters recede and TV cameras are gone, secondary damage from mold and other microorganisms becomes a potential health concern for homeowners and cleanup workers alike," explains Daniel Bernazzani, PhD.

Indoor air quality issues can become especially problematic for residents and volunteers as mold begins to grow on the wet building materials and building contents, creating a complex environment that can be harmful to human health. Residents and volunteers will be breathing in elevated levels of mold and bacterial spores that have become condensed in the indoor environment. They will also be subjected to the toxins many molds and bacteria produce as well as the microbial volatile organic compounds (mVOCs) that off-gas from the mold and bacteria.

(For information on reducing exposure to indoor air contaminants in a disaster area, download free resource brochures at [normiproetf.com](http://normiproetf.com).)

### Natural disaster prep "wish list"

Planning should occur prior to a natural disaster. Prepared residents will be able to better cope in the aftermath as supplies become depleted or unreasonably priced. If the following items are not purchased before a disaster, they may not be available at any price after the disaster.

- » Personal protection equipment: HEPA-filtered respirators,

Tyvek coveralls, boots, gloves, and goggles with no vent holes. Even if the weather is warm, keep your skin covered to protect it from potential contaminants. Your skin is your body's largest organ and can absorb toxins.

- » Buckets, disinfectants, cleaning cloths, brushes, and sandpaper
  - » Generators, dehumidifiers, heaters, fans, and a propane burner for boiling water
  - » Bottled water, nonperishable food, first-aid kit, and snakebite kit
- Store these items offsite out of the flood zone. Being prepared beforehand can expedite the cleanup process and reduce damage to the structure as well as personal property.

### Pre-disaster steps to minimize loss

Here are some steps you may be able to take to protect your belongings from flood waters, if you have enough warning.

- » Move furniture and personal belongings to the highest point in the house, or move them to another location out of the flood area.
- » Remove important documents, family heirlooms, and photographs from the flood zone.
- » Place sandbags where needed.
- » When leaving, turn off the electricity, gas, and water at their source.

While waiting for flood waters to recede, try to line up volunteers to help with the initial removal of water-damaged building materials and personal belongings.

### The race against the clock

Once building materials have become wet, the clock starts ticking. It takes only 24 to 48 hours for mold growth to start. If possible, it is best to remove all water-damaged, porous building materials made with organic material (or material

that can support mold growth) before mold has had a chance to form. However, since this is not always possible, residents and volunteers must use caution when opening up areas such as wall cavities that may contain concentrated levels of mold and bacterial spores, their toxins, and mVOCs.

According to Doug Hoffman, executive director of the National Organization of Remediators and Mold Inspectors ([normi.org](http://normi.org)), implementing the following steps as soon as the property is accessible can save property owners thousands of dollars of damage due to structural mold growth.

- » Remove any standing water. Remove water-saturated sheetrock and insulation 18 inches above the highest watermark to hasten structural drying. Remove water-damaged flexible ductwork. Remove wet carpets, rugs, draperies, and personal belongings. Clear mud and debris from floors and foundation walls to allow the subflooring and foundation to dry.
- » Remove all mold growth on remaining structural building materials by mechanical means. The easiest and most effective way to initially clean mold from structural building materials is with the use of a commercial wet/dry HEPA vacuum, such as a Nilfisk, followed by wiping, scrubbing, scraping, or sanding for complete removal.
- » Don't use bleach to clean mold as it will not remove mold at its "root." The mold will look like it is gone, but it won't be.
- » Dry the structure out as quickly as possible. Turn up the heat, circulate the air with fans, and use a dehumidifier to keep the indoor humidity at less than 60 percent.
- » If there's no electricity, open windows and doors to get air moving to hasten drying.
- » Check your attic as undetected roof leaks can become big structural



mold problems later.

- » Inspect caulking and seals on windows for integrity.
- » Use disinfectants on any portion of the structure contaminated by sewage or flood waters.
- » Don't seal it up until it's dry. Siding, sheetrock, and flooring repairs should be done only after the substrates are completely dry. Confirm moisture content by using a moisture meter.
- » Products such as paint simply cover the mold, but will not stop it from coming back.

### Hidden mold

Removing all visible mold growth from the structure may not take care of the entire problem. Dr. Bernazzani points out, "Some areas of the home may appear to have only minor mold growth or to be free of water damage, yet they may actually harbor considerable contamination. Oftentimes such nonvisible mold contamination can be located on the interior of wall assemblies, hidden spaces in ceilings and floors, and areas surrounding heating and air conditioning systems. Clues to hidden mold include musty, earthy odors that persist following cleaning as well as mold appearing on the backside or edges of wallpaper or the underside of carpets and carpet cushion."

The goal is to remove all sources of moisture and physically remove the mold. Don't try to kill mold. Dead or alive, it is dangerous to human health.

[subhed] Disinfectant basics

The EPA advises using regular bleach to kill germs (not mold) on the portions of the structure and personal property touched by flood waters. (Bleach is an EPA-registered disinfectant.) To identify alternative disinfectants to bleach, look for the EPA label with "disinfectant" or "kills 99.9% of common household germs." Do not use all-color bleach, scented bleach, or splashless bleach as they are not disinfectants. Do not mix bleach with any other cleaner, especially ammonia as it will create toxic gases called chloramines. Jack Thrasher, PhD

does not recommend using bleach. But if you are going to he says, "Only use bleach in a well-ventilated area, as it off-gasses chlorinated radicals, which can be harmful to health."

### Special precautions

A few areas merit a special word of caution:

- » Do not pump the water out of a basement until the water around the structure has receded, as it could cause the basement walls to collapse.
- » Exposure to generator fumes can cause carbon monoxide poisoning. Do not use generators indoors, in a garage, near doors, windows, or vents, on balconies, or anywhere near sleeping areas.
- » Check plumbing and sanitary systems. The force of the flood waters may have shifted them. They may leak when the water is turned back on.
- » Flood waters can contaminate water supplies. Do not drink tap water until your local water municipality has cleared it as safe to drink or private well water until it has been properly tested.

### DIY or hire a professional?

Not everyone should attempt to do their own cleanup after a flood or other natural disaster. The CDC has identified certain high-risk groups whose health is more adversely affected from exposure to mold and mold toxins. If you are in one of these high-risk groups, you should not perform mold cleanup tasks. For a complete list of the designated groups, please refer to the free resource brochures at [normiproetf.com](http://normiproetf.com).

If performing your own cleanup is not an option and adequate volunteers are not available to assist, your only option is to hire a professional. The challenge will be to find one who is available (those services will be in high demand) and competent. Be careful in the selection process as opportunistic, untrained "pickup truck remediators" are notorious for travelling hundreds of miles to

take advantage of distressed property owners in disaster areas. That doesn't mean all cleanup crews from outside of the disaster area are unqualified. Many well-trained, certified professionals travel to disaster areas to assist.

When interviewing professionals be sure to thoroughly check credentials. Ask them for proof of their certifications, years of experience, and references. Verify they meet all professional state licensing requirements and are licensed, bonded, and insured specifically for performing such work as a business. Ask for copies of their general liability and pollution coverage binders, which insurance companies routinely provide for this purpose. If they cannot provide you with documented proof of certifications and insurance coverages, chances are they don't have them. Move on to interview the next professional.

For those of you who are not in any of the CDC's high-risk groups and who choose to undertake your own post-disaster cleanup, we strongly encourage you to take all precautions to protect your health from unnecessary mold exposures by ventilating the work area as much as possible and by always wearing adequate personal protection equipment. By taking these precautions, you minimize the risk to your health. ☺

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LEE ANN BILLINGS is coauthor of the Amazon best-selling book *MOLD: THE WAR WITHIN*. After mold and chemical exposures from Hurricane Katrina, Ms. Billings conducted thorough research and she and her family were able to restore their health through natural means. For more in-depth information and resources, see [booksthatgive.com](http://booksthatgive.com).

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