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### \*\*\*AFTER THE FLOOD

After a flood event, clean up begins. Be safe and reduce the risk of further damage by cleaning and restoring property and vehicles correctly. This guide summarizes important post-flood information such as how to document damage, safely clean and repair basements, and dry out structures.

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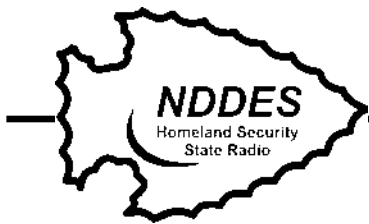
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## **Floods: First Entry of a Flooded Home - Precautions**

### **■ Structural Integrity**

When first returning to a flooded home, you may face many threats to life and health. The first and most obvious issue: is the building structurally sound? Only a structural engineer or other building official can answer this with any certainty, but some warning signs include:

- Is the building shifted off its foundation?
- Is the foundation itself damaged?
- Is the building racking – no longer square, but leaning to one side?
- Is the building partly destroyed – missing a wall, for example, or partially crushed?
- Is the roofline out of position?

If any of these are true, then the building may collapse at any time. It must not be entered unless a qualified official has declared it safe. Don't take any chances!

Is the basement flooded? If so, then make sure ground water has receded before pumping it out. Basements that are pumped out while the ground is still soaked may collapse as the outside water pressure is no longer balanced by pressure inside the basement.

### **■ Site Hazards**

- Beware of debris piles--they may shift or collapse at any time. They may harbor rodents, snakes or other vermin.
- Beware of walking through flooded areas; there may be holes or drop offs that you can't see.

### **■ Other Hazards**

#### **Electrical hazards:**

- Is the electricity turned off? Do you know this for certain? If you are not certain:
- Do not enter the basement if it is flooded.
- Do not touch any electrical devices especially if you are standing in water or in contact with the earth.

#### **Combustible or explosive gases:**

When flooding is severe, gas lines are often broken if the building has shifted or if major appliances have moved about. Open all windows when first entering a building. If you smell gas or hear it escaping:

- Don't smoke or light matches.
- Don't use cell phones or regular phones.

- Don't operate any electrical switches, which may spark.
- Don't create any other source of ignition.
- Exit the building immediately, leaving doors and windows open.
- Do notify emergency authorities.

### **Carbon monoxide:**

Carbon monoxide (CO) is a colorless, odorless gas that is produced when any fuel is burned. High concentrations can kill! When coming back to a house that is wet, cold and without heat or power, it is tempting to use an electric generator, or an improvised heater, such as a BBQ or camp stove. Do not operate these devices indoors. (Opening windows is not sufficient to prevent CO buildup.) Make sure gas-powered electric generators are outdoors (or, if indoors, properly vented) and away from windows or other air intakes. Fuel-fired, unvented space heaters can be used if manufacturers' directions are carefully followed. Note that these devices produce large amounts of moisture as fuel is burned, so their drying ability is quite limited.

Do check chimneys and flues for blockage by debris before using furnaces, hot water heaters, wood stoves, etc.

### **Mold:**

Mold and other organisms, such as bacteria and viruses that thrive in wet environments can trigger negative health effects. These range from irritation, coughing and headache to asthma attacks and possibly life-threatening infections.

Here are a few of the most important things that you should know about mold:

There is an association between exposure to mold spores and debris from mold cells and health problems.

Mold that is killed can still cause health problems; killing mold, with bleach for example, does not make it harmless. Some people are especially sensitive to mold, and react strongly to levels that don't bother others.

There are likely to be large amounts of mold in the air after a flood, both inside and outside.

Disturbing dry moldy materials can release large amounts of spores and debris into the air.

Common "dust masks" do not give needed protection against mold. The minimum needed is a mask with an "N 95" designation. Stronger protection - N 100 masks or toxic particle respirators along with goggles and other protective gear - will be needed for high levels of mold exposure.

*Source: NDSU Extension Service - [http://www.extension.org/pages/Floods:\\_First\\_Entry\\_of\\_a\\_Flooded\\_Home\\_-\\_Precautions](http://www.extension.org/pages/Floods:_First_Entry_of_a_Flooded_Home_-_Precautions)*



## **Floods: First Entry of a Flooded Home - What to do: Document and Protect**

There are two things that need to be done as you start repairing damage from a flood:

- Make a record of damage and losses.
- To the extent that you are able, prevent further damage to the building.

If you are not sure how to do any of these things, ask. In most communities, shortly after a flood or similar disaster, there are lots of experts who have helpful information arriving to the area to assist residents.

### **■ Making a Record of Losses and Damage**

- Take photos. Do this inside and out. You can't have too many pictures. Pictures should show any structural damage to the building and furnishings, and any items of particular value.
- Record the serial numbers of any appliances or equipment that is thrown out.
- This information is valuable for filing insurance claims and for documenting losses for other purposes, such as tax deductions.

Insurance after natural disasters such as flooding is a complicated, difficult and often frustrating issue. One important point to remember is that the insurance company will try to settle a claim for as little money as possible, and their adjusters work towards that goal. For this reason, consider hiring your own adjuster to deal with the insurance company. You can find independent adjusters listed in the yellow pages. Look under "Adjusters." These individuals are skilled at negotiating with insurers, and their fee is usually based on a percentage of the recovery that is received from the company.

### **■ Prevent Further Damage**

- Remove floodwaters, mud and silt.
- Open doors to allow water to exit.
- Arrange to have basement pumped out. Only do this when you are certain that the earth around the building is no longer saturated!

Otherwise, water pressure may collapse basement walls as the basement is drained.

- If water is running from broken pipes, shut off the water supply to the house. Usually, there is a valve at the meter. If you cannot find this, contact the water company.
- Allow the building to dry out. This can reduce or prevent mold growth, but must be done quickly, usually in 48 hours or less.
- Open doors and windows, and open up wall cavities if walls have gotten wet. Remember that these measures will only be effective if outside humidity is low. In high moisture conditions, a heat source or some sort of mechanical drying equipment will be needed.
- Be sure to use personal protection against mold and other harmful pollutants. This is especially important if mold has dried out, and also very important if floodwaters are contaminated. (LSU Part 3).
- You may also need to secure the building from looters when you are not present. Doors and windows should be locked, or secured with plywood, if possible. Portable valuables should be removed to a secure location.
- Prevent further water damage. If the roof or walls have been damaged, temporary or permanent repairs should be arranged as soon as possible.
- Salvage valuable items first. These include such things as cash, jewelry, important documents and family treasures. Clean off the mud and allow items to dry. If items like photos and books cannot be immediately dried, clean off the mud, place in plastic bags and find a friend with an operating freezer. These items can be frozen and dried later.
- Discard items that cannot be salvaged. The general rule is that hard materials and building components that are not damaged by water can be dried out and salvaged, although if mold is involved, cleaning may require more labor than the item is worth. Since flood waters are considered to be contaminated, generally absorbent materials should be discarded. Rugs or other items that can be laundered or thoroughly cleaned may be salvaged. Unless absorbent materials can be dried out within 48 hours (longer if temperatures are cool or sooner if temperatures are warm), mold growth may make cleaning impossible. Heirlooms and items of special value can be saved by the use of specific treatments and procedures, if available. Contact local or area

museums. Paper records can be spread out and air-dried, preferably on blotting paper. Papers that can't be dried in 48 hours can be put in a freezer until it is possible to dry them.

- While it may be possible to salvage household appliances, heaters, etc., it can be very difficult to dry and remove mud and silt from their inner workings so these are often discarded. This is especially true for saltwater flooding.
- Service damaged septic tanks, cesspools, pits and leaching systems as soon as possible. These can be serious health hazards.

### ■ Take Care of Yourself

Flooding and other disasters are highly stressful for all involved. Keep the family together for mutual support. Discuss problems with others - friends and neighbors can offer mutual support, too. Rest often and eat well. Set manageable goals. Take care of, and comfort, your kids. If problems seem overwhelming, seek professional help. Such feelings are common after disasters, and talking to a professional can help a lot.

*Source: NDSU Extension Service - <http://www.extension.org/pages/Floods: First Entry of a Flooded Home - What to do: Document and Protect/print/>*



## Salvaging After Flooding

### ■ Recovery and Salvage: What Can Be Salvaged, What Cannot

The purpose of this document is to give an overview of those materials that can be salvaged and those that cannot and how to make some decisions. Floodwaters from an overflowing body of water will likely deposit mud and silt throughout the building and within enclosures, such as electrical appliances, switches, cabinets, etc. This makes thorough cleanup difficult, since the silt may contain toxins and biohazards. A detailed discussion of cleanup and salvage is available in the resources listed below.

### ■ Absorbent Materials

Floodwater is considered to be contaminated with biological and chemical contaminants. As a general rule, soft absorbent materials must be dried out within 48 hours (this period may extend to 72 hours in cooler conditions and may be shortened in warmer temperatures.) This has to do with mold growth. Mold cells reproduce quickly, often doubling in a matter of hours. This process goes faster when temperatures are warmer.

**Carpet:** Since flood water is contaminated, salvaging flooded carpet involves more than drying. Carpeting can sometimes be saved if it can be cleaned by a professional.

**Mattresses:** It is unlikely that mattresses can be adequately dried.

**Upholstered furniture:** It is unlikely that upholstery can be adequately cleaned and dried soon enough. It may be possible to salvage the frame and re-upholster the piece, but first decide if the piece is worth salvaging.

**Wood furniture:** Solid wood furniture can often be saved if it is not severely damaged. It may be necessary to disassemble and re-glue. Refinishing may also be necessary. Cleaning and drying are essential first steps. Further repairs can be done at a later time. Veneered furniture repairs involve considerable time and skill and are best left to professionals unless damage is slight. Replacement may be the better choice unless the piece has special monetary or sentimental value.

### ■ Hard, Non-Absorbent Goods

These can usually be cleaned, dried, and salvaged.

Electrical Appliances:

Be extremely cautious! Plugging in an appliance that has not completely dried can deliver a fatal shock. Opening up some appliances, such as TV sets, can pose a shock hazard even when the device is not plugged in.

Unplug the appliance before working on it; make sure that power to the house is off before unplugging or touching the appliance. Before power is turned back on, unplug all appliances that have gotten wet. Flooding can cause short circuits that can later deliver a fatal shock.

Appliances that have been submerged generally cannot be salvaged. It may be possible to repair those that have gotten wet by rainwater but were not flooded.

Small appliances, or older, large appliances are generally not worth salvaging.

Electronic appliances, TV sets, audio equipment, media players generally cannot be salvaged.

Restoration of an appliance involves two basic steps: cleaning and drying the device itself and cleaning and drying the motor, switches and controls. Cleaning and drying will be complicated if fibrous insulation (such as fiberglass, found in some stoves, refrigerators, etc.) has gotten wet. Motors and other components will need to be disassembled. All repaired appliances must be tested by a qualified individual before being put back into service.

**Source:** NDSU Extension Service -  
[http://www.extension.org/pages/Salvaging\\_After\\_Flooding](http://www.extension.org/pages/Salvaging_After_Flooding)



## **Septic Systems and Flooding**

*Flooding can cause problems at homes with individual septic systems. If drains in the house run slowly or are backing up, pumping the septic tank will provide at best three or four days of reprieve but the problem will return. Pumping the tank is a dangerous and potentially costly mistake because it can cause considerable damage to the system.*

An individual home septic system has two main components:

- A septic tank which holds about three to four days of normal water use from the house and traps solid waste.
- A drainfield which infiltrates the waste water into the ground.

If your drainfield area is flooded or very saturated you might notice some problems:

- drains in the house will run slow
- toilets drain slowly or sound strange when flushed
- water may back up into floor drains in the basement

When these problems occur, generally the septic tank is blamed. In reality, these problems are usually caused by the flooded or saturated drain field. Often the water can't flow out of the septic tank to the drainfield because of the flooded or saturated conditions, so the water backs up into the septic tank, which fills up, causing the water to back up into the house and ultimately into the floor drains.

Under flooded or saturated drain field conditions, do NOT have the septic tank pumped!

At best, pumping the tank is only a temporary solution. Under worst conditions, pumping it out could cause the tank to try to float out of the ground and damage the inlet and outlet pipes.

The best solution is to plug all drains in the basement and drastically reduce water use in the house. Some suggested ways:

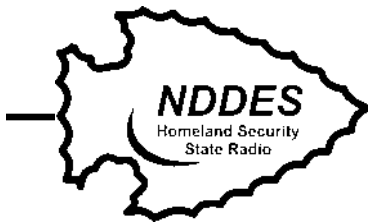
- First make sure there are no leaking fixtures in the house. Check faucets, shower heads, toilets, sinks and any other water-using devices for leaks and repair them as

soon as possible. Even a drop of water every 15 seconds can add up to a lot of additional water in the septic system.

- Don't put water from a basement sump pump into the septic system.
- Don't let water from roof gutters or the sump pump discharge into the drain field area.
- Reduce the number of times you flush the toilet. A good rule might be one flush per person per day.
- Reduce the number of showers or baths. A good rule might be one bath or shower every other day per person.
- Don't use the dishwasher or garbage disposal.
- Don't do laundry, or take it to a laundromat if possible.

Common sense is the key to reducing water use in the house. Remember, the drainfield was designed to infiltrate the amount of water normally discharged from the house. When additional water from rain, snow, or flooding is added to the drainfield, its ability to handle household water becomes seriously limited.

*Source: NDSU Extension Service – Tom Scherer, Agricultural Engineer - <http://www.ag.ndsu.edu/disaster/flood/septicssystemflood.html>*



## **Sump Pump Questions**

For many homeowners the first line of defense against water in the basement is a sump with a pump in it. The sump may be connected to drain tile that drains the footings of the house, under the entire basement, or just the area where the sump is located. Many houses have tiling installed only around a portion of the house. The water that drains into the sump must be removed, and this is accomplished with a sump pump.

The two basic sump pump models are the up-right (commonly called a pedestal) and the submersible. Either will work well with proper maintenance.

The pedestal pump has the motor on top of the pedestal and the pump at the base, which sits on the bottom of the sump. The motor is not meant to get wet. The pump is turned on and off by a ball float. One advantage of this type of pump is that the on/off switch is visible so the action of the ball float can be easily seen. Submersible pumps are designed to be submerged in water and sit on the bottom of the sump. The on/off switch is attached to the pump and can be either a ball float connected to an internal pressure switch or a sealed, adjustable, mercury-activated float switch. The sealed mercury switch is generally more reliable than the pressure switch.

Either type of pump should have a check valve on the water outlet pipe so water doesn't flow back in the sump when the pump shuts off. Water flowing back and forth can cause the pump to turn on and off more frequently than necessary and decrease the life of the pump.

### **■ Some frequently asked questions about sump pumps:**

#### ***Q. How do you check or test a sump pump?***

A. First, make sure the outlet pipe is not frozen shut or plugged and that it directs water away from the house. Next make sure the pump is plugged in. Remove the lid (if the sump has one) and use a flashlight to check if the sump is clean and that the pump inlet is not plugged. Then slowly pour about 5 gallons of water into the sump. Try to simulate the speed that water would normally flow into the sump. Watch the action of the on/off switch and listen to the pump. Make the pump turn on and off at least twice. If something doesn't work right, fix it as soon as possible.

#### ***Q. Can you burn the pump out if the outdoor pipe is frozen shut, or will it automatically shut off?***

A. Most pumps will not burn up, but they can overheat if left in this condition. Almost all sump pump motors have thermal protection built in. If they do overheat you just have to shut them off and let them cool down. The thermal relay will reset.

***Q. What size pump should I have for my house?***

A. There is no "correct" size. The horsepower requirement for a house is determined by the area of drainage connected to the sump, the depth to groundwater, the depth of the basement, and many other factors. A 1/3 hp pump is satisfactory for most houses.

***Q. Are there any problems with replacing a 1/3 hp pump with a 1/2 hp pump?***

A. When used in similar conditions, a 1/2 hp pump will pump more water and lift it higher than a 1/3 hp pump. Most new sump pumps will have a chart or graph in the instructions or on the box that shows the flow versus height of lift for both sizes. The flow is usually given in either gallons per minute or gallons per hour (multiply gpm by 60 to convert to gph). The height of lift is given in feet of vertical lift. There shouldn't be any problem, but where the flow into the sump is relatively slow there would be no advantage to using the larger pump. However, in situations where water flow can become rapid, a 1/2 hp pump may be able to keep up with the flow where a 1/3 hp pump may not.

***Q. Do sump pumps have filters which need to be cleaned or replaced?***

A. Sump pumps do not have filters, but they do have screens or small openings where the water enters the pump. These can sometimes be plugged.

***Q. Can or should you pump into a sewer drain or basement floor drain?***

A. No, you should not. If you have a septic system, under no circumstances should the sump be pumped into the basement floor drain. During wet conditions the drainfield of the septic system is usually saturated and struggling to handle the normal flow of water from the house. Adding to it with a sump pump can damage the septic system. Even if you are connected to a public system the sump should not be pumped into a floor drain. Putting additional water into the sewer system can overload the public system, and there may be a regulation against pumping into it.

***Q. Where should the sump pump drain hose be run?***

A. Preferably, sump water should be discharged at least 20 feet away from the house in such a way that it drains away from the house. It should not be directed onto a neighbor's lot, into window wells, or onto a septic system drainfield.

***Q. Can the average person replace a defective sump pump or does it require specialized tools or the expertise of a plumber?***

A. Almost all sump pumps come with a list of required tools and directions for installation. It should not be difficult for the "average" person to replace a sump pump.

***Q. How big should the sump hole be? What kind of hole liner should you use? How much gravel do you put under and around it?***

A. Sump holes should be about 2 feet in diameter. This allows space for the pump and associated piping and to store water between pumping events (about 15 to 25 gallons). Metal or plastic liners can be used, but plastic is easier to work with and is the material of choice. When the sump liner is installed, about 3 to 4 inches of coarse gravel should be placed in the bottom of the hole. The gravel forms a solid base for the pump as well as helping to prevent mud and other debris from clogging the pump.

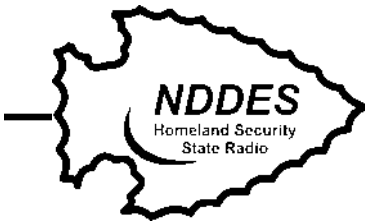
***Q. Should the sump pump be on an isolated electrical circuit?***

A. A standard 15-amp, three-prong grounded outlet is sufficient to handle a sump pump. A sump pump is always in or near water, so it is best to have an outlet with a ground fault interrupter (GFI).

***Q. I don't have a sump in my basement but am concerned about water leaking in. What can I do?***

A. You can push the water to the floor drain, but if water backs up in the floor drain or drains very slowly a pump is needed. Small pumps sometimes referred to as "skimmer" pumps are designed to sit on a flat surface and pump when water on the floor is only 1/4 to 1/2 inch deep. They can often be used with a common garden hose. A 50-foot garden hose run out through a basement window will usually carry the water far enough away from the house. You can remove more water by taking the cover off the floor drain and placing the pump in the drain bowl -- these pumps are usually small enough to fit in the bowl. In emergencies where electric service is off, these pumps can be powered by a small gasoline generator.

**Source:** NDSU Extension Service – Tom Scherer, Agricultural Engineer - <http://www.ag.ndsu.edu/disaster/flood/sumppumpquest.html>



## ■ **Cleaning and Repairing Flooded Basements**

Before you enter a flooded basement, take time to:

- Turn off the electricity, preferably at the meter.
- Check outside cellar walls for possible cave-ins, evidence of structural damage or other hazards.
- Turn off gas or fuel service valves.
- Open doors and windows or use blowers to force fresh air into the basement.

## ■ **Pumping**

For safety reasons, do not use an electric pump powered by your own electrical system. Instead, use a gas-powered pump or one connected to an outside line. Fire departments in some communities may help with pumping services.

- More damage may be done by pumping flooded basements too soon or too quickly. Water in the basement helps brace the walls against the extra pressure of water-logged soil outside. If water is pumped out too soon, walls may be pushed in or floors pushed up. To help prevent this kind of structural damage:
  - Remove about a third of the water each day. Watch for signs of structural failing.
  - If the outside water level rises again after the day's pumping, start at the new water line.
  - Don't rush the pumping; the soil may be very slow to drain. Whatever is submerged in the basement will not be damaged further by delaying the pumping.

## ■ **Cleaning**

After water has been pumped from the basement, shovel out the mud and debris while it is still moist. Hose down walls to remove as much silt as possible before it dries. Floors and walls may need sanitizing, particularly if sewage has entered the basement. Scrub walls and floors with a disinfecting solution of 1 cup chlorine bleach per gallon of water.

Oil stains caused by overturned or damaged oil tanks also may be a problem following basement flooding. Commercial products, available from fuel-oil

suppliers, will help neutralize fuel oil. The products come in powder form or an aerosol spray for hard-to-reach places. To remove oil stains and destroy odor: wipe up excess oil, shake or spray product on the spot according to manufacturer's directions, let it set, then sweep it up.

## ■ Inspection and repair

Before beginning repairs, make a thorough inspection of supporting columns, beams, walls and floors. Unless you have structural expertise, hire a contractor to make a professional survey. (Consider joining with neighbors for a group-rate inspection.) Repairs may extend to the following:

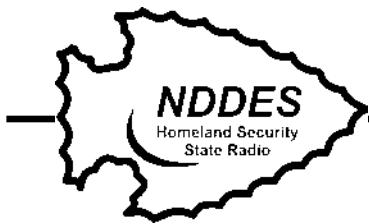
***Buckled walls:*** Signs of buckling include horizontal cracking and areas that have moved out of vertical alignment. When this condition is minor, you need not repair the wall immediately. However, any noticeably buckled wall will eventually collapse from normal ground pressures and seasonal temperature changes. When buckling has seriously weakened the wall, the damaged parts should be rebuilt immediately. Pilasters (vertical reinforcements) may need to be constructed into walls over 15 feet long.

***Settled walls and footings:*** indicated by vertical cracks either in small areas or throughout the structure. Repairs are difficult without special equipment. Contact a reliable contractor for this work.

***Heaved floors:*** those that have not returned to their original level or have cracked badly. The floor may have to be removed and a new floor constructed. If a floor is badly cracked, but has returned to its original level, a new floor may be placed over the old one. A vapor barrier should be added between the two floors. The new floor should be at least 2 inches thick.

In houses without basements, the area below the floor may be completely filled with mud. Shovel out the mud as soon as possible to avoid rotting joists or foundation wood.

**Source:** NDSU Extension Service - <http://www.ag.ndsu.edu/disaster/flood/cleaningandrepairingfloodedbasements.html>



## ■ Floods: Drying Out

This publication is intended to give quick, brief answers to the many issues that arise after a flood. You will not find detailed instructions here, but the answers will direct you to short fact sheets and the sections of several booklets that have detailed instructions.

**BEFORE ENTERING THE BUILDING, MAKE SURE IT IS STRUCTURALLY SOUND AND SAFE TO ENTER. IF YOU ARE NOT SURE, ASK LOCAL OFFICIALS FOR ADVICE. THIS IS VERY IMPORTANT!**

### ■ Drying Out the House

**First:** Remove as much water as possible, using pumps, wet-dry vacuums, squeegees, etc. (A basement filled with water should be emptied about one-third per day. Rapid water removal may cause the basement walls to collapse. See more information below.) Mechanically remove as much water as possible; this is easier than drying by evaporation. Remove mud and silt. If flooding involved polluted water (chemicals, sewage, etc.), then additional cleaning and sanitizing will be necessary. Refer to "Types of Flooding" below.

**Second:** Once all liquid water has been removed, the wet building will need to be dried out, and contents will need to be dried or thrown away. If electricity is available, fans greatly increase the evaporation rate if the air the fan is moving is dry. Fans must be combined with a method of removing moisture from the air, such as some type of dehumidification or ventilation air exchange pulling in warm, dry exterior air and exhausting damp inside air. Electric space heaters can provide heat, but large heaters are required to warm the air enough to efficiently dry. Fuel fired heaters produce large amounts of moisture, so they are of limited value unless the heaters are vented to the outdoors. Burning a gallon of kerosene produces about a gallon of moisture. (Professional equipment includes refrigerant and desiccant dryers.)

Walls that have gotten wet must be completely dried out before they can be rebuilt. Mold will grow in wet walls that are closed up before they dry. Sometimes wet plaster can be recovered if it has not separated from the lath. Usually, wall board or plaster is torn out to the floodline, in increments of two feet (for example, 2 feet, 4 feet or 6 feet), to be replaced by half or whole sheets of drywall. If future flooding is a possibility, consider using paperless ("mold proof") drywall. Wet insulation must be discarded. If moldy, wall cavities need to be cleaned. Walls are then allowed to dry before being closed up. Mold can be a health hazard and must be removed before the house can be lived in. For specific details, see "Creating a

Healthy Home: Field Guide for Clean-up of Flooded Homes," sections 5-7, Enterprise Community Partners and National Center for Healthy Homes.

## ■ Flooded Basements

If the basement is flooded, do not enter unless you know for certain that the electricity is shut off from the outside. If you know, for sure, that electricity is off for the entire neighborhood, you can safely shut off power at the home's main switch.

Flooded basements can be pumped out once outside floodwaters have receded. Local fire departments or emergency agencies often are able to help with pumping out basements.

**IMPORTANT!** If the earth outside has been saturated, then pumping must be done slowly, as groundwater subsides. Otherwise, extra pressure from the groundwater will cause basement walls to cave in. Refer to "Types of Flooding" below.

## ■ Types of Flooding: Know What You're Dealing With. There

are three types of flood waters:

Category 1 is clean water posing no threat to human health. This could be from a roof leak (rainwater) or a broken water (supply) pipe.

Category 2 water contains significant chemical, biological or physical contamination. This water can cause discomfort or sickness in humans. This type of flood water is also called "grey water."

Category 3 water contains biological agents coming from sewage or other sources that are likely to cause discomfort or illness. All seawater, ground surface water or waters rising from rivers or streams falls into this category. This type of flood water is also called "blackwater." This water will have silt in it and perhaps other foreign matter and is considered very unsanitary.

For both grey water and blackwater, special measures are needed for cleanup and sanitizing. Professionals with specialized training are best equipped to work in areas with such contamination. If you must enter, be sure to wear gloves, boots, goggles, a suitable respirator and protective clothing. This contamination poses significant health threats. Use cleaners to wash all flooded surfaces, then sanitize using a solution of one cup of chlorine bleach to one gallon of water. The surface should stay moist for 10 to 15 minutes for the sanitizing to occur.

*Source: NDSU Extension Service - [http://www.extension.org/pages/Floods:\\_Drying\\_Out](http://www.extension.org/pages/Floods:_Drying_Out)*



## ■ Dry Out Before Rebuilding

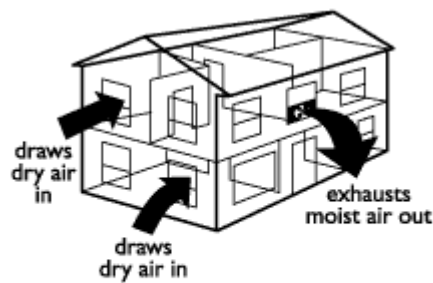
**The problem:** Wood submerged in water will absorb a large amount of water. Rebuilding too quickly after a flood can cause continuing problems such as mold growth, insect infestations, and deterioration of the wood and wall coverings.

**How long until it's dry?** It may take weeks for the wood to be adequately dry to close a wall. The drying time will vary depending on the initial moisture content and the drying conditions.

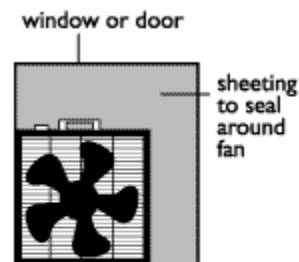
**How can I tell if it's dry enough?** Test it with a wood moisture meter. Wood should have a moisture content of less than 15 percent before drywall, paneling or other coverings are placed on the wood. Do-it-yourselfers may be able to borrow or rent a meter from a hardware store or lumberyard. Some county offices of the NDSU Extension Service have meters that can be checked out. If a contractor is doing the work, homeowners should have the contractor verify with a meter that the wood is dry.

## ■ How Can I Dry Things Out?

**Ventilation.** Ventilation is usually the best way to dry things out and can remove several gallons of water per day. Provide an entrance and exhaust opening for air to promote cross-ventilation. Place a fan in a window or door with the fan to the outdoors. Seal the rest of the opening with cardboard, plywood or blankets so the fan can create a vacuum. Use fans to circulate air over wet surfaces. Face fans into corners or other hidden areas.



**Provide an entrance and exhaust opening for air.**

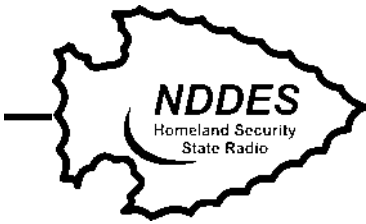


**Place fan facing out in a window or door and seal the rest of the opening.**

**Heat.** Heat increases the moisture-holding ability of the air. Use your furnace or large heaters to heat the air. Small space heaters will have little effect. As wood gets drier it may be helpful to heat the house for a few hours then ventilate to exchange moist air with dry air.

**Dehumidifiers.** A dehumidifier can be used if outside air is humid. Dehumidifiers function most efficiently at warm temperatures. At 80 degrees and 60 percent relative humidity, most dehumidifiers will remove 1-2 pints of water per hour from the air.

*Source: NDSU Extension Service - <http://www.ag.ndsu.edu/disaster/flood/dryoutbefore rebuilding.html>*



■ **Drying and Repairing Walls: Remedies for Interior and Exterior Surfaces**

Walls must be dry from the inside out before restoration, repainting or recovering can begin. Even when walls feel dry to the touch, the material inside the wall may be wet. Drying the inside of the walls may take weeks or even months. The total drying time will depend partially on the amount of dry air that can circulate through the studding and different wall materials.

Plaster and paneling can often be saved, but you still need to get air circulating in the wall cavities to dry the studs and sills. Wallboard soaked by dirty floodwater will need to be replaced. If the wallboard was damaged by clean rainwater, consider cutting a 4- to 12-inch-high section from the bottom and top of walls. This will create a "chimney effect" to speed up drying time. A reciprocating saw with a metal cutting blade works well for this task, but use only the tip of the blade and watch out for pipes, ductwork and wiring.

■ **Guidelines for Wall Coverings and Insulation**

Remove drywall, laminated paneling and plaster at least to the flood level. Warping above the water level often occurs with drywall and paneling, so more may need to be removed.

Plaster walls can sometimes be adequately drained by removing the baseboard and breaking out plaster and lath at the bottom of the wall. Later the baseboard can cover the opening.

Some paneling may be salvaged if allowed to dry slowly. Remove the baseboard from paneled walls and pry off the individual sheets. Prop them against the wall to dry. Don't allow them to dry in sunlight, which may cause warping.

Remove vinyl-covered wallpaper. It will restrict drying within flood-damaged walls.

Water-soaked insulation should be removed and replaced. It can hold water for months, causing odor and decay problems. While wet it has little insulation value. Consider wainscoting as a restoration option if flooding is no higher than 3 feet above the floor.

## ■ Patching Plaster

Do not attempt to repair plaster until walls and inner walls (studding and insulation) are completely dry. If walls were flooded extensively, you may need to wait four to six weeks, or even several months, before attempting repairs.

Drywall compound is the preferred method for patching plaster. It comes in a variety of types with different drying times, shrinkage characteristics and consistencies. Read labels to select the type you need.

## ■ Repairing Exterior Siding

Dry wall cavities from the inside if possible. Remove small section of siding to check conditions on the reverse side. If crevasses are filled with silt, remove siding to water level and clean. Silt left in crevasses will trap moisture, causing mold, decay and peeling paint.

Check for cracked or warped siding. If only a few boards are warped or cracked, replace them individually.

## ■ Checking Sheathing

Sheathing is the material between studding and finish siding. Depending upon the type of sheathing, replacement may or may not be necessary.

Wooden boards should dry slowly and some will warp. Re-nail warped areas after they dry. Replace those that are too badly warped to salvage.

Sheathing board is usually absorbent and difficult to dry. Replace any that is disintegrating or separating.

Plywood will probably separate and must be replaced. Marine plywood will not warp or separate, but is generally considered too expensive to use in residential construction unless the building is subject to frequent flooding.

*Source: NDSU Extension Service - <http://www.ag.ndsu.edu/disaster/flood/dryingandrepairingwalls.html>*



## ■ Flood-Damaged Furniture and Appliances: Deciding What to Salvage and Tips on Reconditioning

Evaluating appliance damage is a high priority after a flood. Have a service person check flooded appliances before you attempt operation or invest a lot of time in clean-up.

Deciding which furniture to save may be a more personal issue, especially if you have antiques and other pieces with sentimental value. Keep in mind that you don't need to repair all pieces of salvageable furniture immediately. You can clean, dry, and store them in a warm, well-ventilated place until you have time to deal with them.

### ■ Appliances

Before entering a home after a flood, be sure that the electricity to the dwelling has been completely shut off. Appliances should not be operated until they have been checked by service personnel.

Here are some things that may need to be done:

Electrical motors may need to be reconditioned or replaced.

Wiring and fixtures need to be checked and cleaned. They may also need replacement.

Before cleaning and sanitizing an appliance, be sure the motor is in safe working order. It may not be worth the time to clean up the unit.

A rust inhibitor may need to be applied to all metal parts. Even though an appliance may not have been submerged, rust can develop from dampness in the air.

### ■ Refrigerators and Freezers

Sanitize the refrigerator or freezer if water has seeped in. Be sure the motor and freezing unit is in safe working order and insulation is not wet. Wet insulation means replacement may be necessary.

Remove and wash all shelves, crispers, and ice trays. Wash thoroughly with water and detergent. Rinse with a disinfectant solution.

Wash the interior of the refrigerator, including the door and door gasket, with hot water and baking soda. Rinse with a disinfectant solution.

Leave the door open for about 15 minutes to allow free air circulation.

If odor remains, place several pieces of activated charcoal in an open metal container, or use a commercial refrigerator deodorizer.

Wash the outside with a mild detergent and hot water.

## ■ Laundry Equipment

After washers and dryers have been reconditioned, sanitize them as follows:

Pour a disinfectant (chlorine, pine oil, or phenolic) into the empty washing machine. Then complete a 15-minute cycle at the "hot" water setting. Unplug the dryer and wipe the drum and door with a cloth dipped in disinfectant solution. Rinse with a cloth dipped in clear water. Leave the dryer door open until all parts are thoroughly dry -- preferably overnight.

## ■ Furniture

Before starting to salvage damaged furniture, decide which pieces are worth restoring. Such decisions should be based on: the extent of damage, cost of the article, sentimental value, and cost of restoration. Antiques are probably worth the time, effort, and expense of restoration. Unless damage is severe, you may be able to clean and refinish antiques at home.

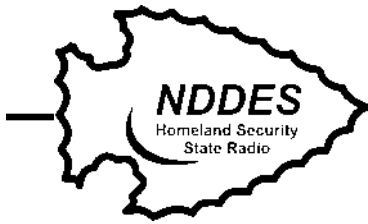
Don't try to force open swollen wooden doors and drawers. Instead, take off the back of the piece of furniture to let the air circulate. You probably will be able to open the drawers after they dry.

Solid wood furniture can usually be restored, unless damage is severe. It probably will need to be cleaned, dried, and re-glued. Wood alcohol or turpentine applied with a cotton ball may remove white mildew spots on wood. Cream wood restorers with lanolin will help restore good wooden furniture parts.

Wood veneered furniture is usually not worth the cost and effort of repair, unless it is very valuable. If veneer is loose in just a few places, you may be able to glue it adequately.

Upholstered furniture soaks up contaminants from floodwaters and should be cleaned only by a professional. Get a cost estimate to see if furniture is worth saving. Usually, flood-soaked upholstered pieces should be thrown away unless they are antiques or quite valuable.

*Source: NDSU Extension Service - <http://www.ag.ndsu.edu/disaster/flood/flood-damagedfurnitureandappliances.html>*



## ■ **Flood-Damaged Walls, Ceilings and Floors: Removing Moisture, Cleaning and Repairing**

Be prepared to let flood-damaged walls, ceilings and floors dry for several weeks. If restoration work is completed before proper drying, mold and mildew will continue to grow. The result may be structural damage to your home, the need to repaint walls or replace new wall coverings, and discomfort or illness to family members who have allergies.

### ■ **Getting the Moisture Out**

Remove all water as soon as possible from your home. Also remove furnishings that are water soaked. Once water is removed, the next step is removing moisture that has been absorbed by wood, plaster and other materials.

If the weather permits, open doors and windows to remove moisture and odors. If the outside humidity becomes greater than inside, close things up; likewise, close up the house overnight if temperatures drop and moist air might otherwise be drawn indoors. If windows are stuck tight, take off window strips and remove entire sash. If doors are stuck, drive out door hinge pins with a screwdriver and hammer, then remove.

Consider using dehumidifiers to speed up drying when outside humidity levels are high. If possible, rent commercial dehumidifiers, which remove three to four times more water than home models. When using dehumidifiers, shut windows and doors. If there is severe flooding in your home, consider hiring a contractor for water removal. Some companies can dry homes in less than a week with commercial dehumidifiers and air movers.

### ■ **Walls and Ceilings**

Wash out mud, dirt and debris as soon as possible with a hose and mop cloth or sponge.

Start cleaning from the top floor or upper limit of flooding and work downward.

Remove wallboard, plaster and paneling to at least the flood level. Wallboard acts like a sponge when wet. If soaked by contaminated floodwater, it can be a permanent health hazard and should be removed. If most of the wallboard was soaked by clean rainwater, consider cutting a 4- to 12-inch-high section from the bottom and top of walls. This creates a "chimney effect" of air movement for faster drying. A reciprocating saw with a metal cutting blade works well, but use only the tip of the blade and watch out for pipes, ductwork and wiring.

Plaster usually does not need to be replaced, though it will take a very long time to dry.

Some paneling may be salvaged if allowed to dry slowly. You also should remove and dispose of any flood-damaged insulation, which will hold water for months after getting wet.

#### ■ **To clean surfaces:**

Thoroughly wash and disinfect walls, ceilings, exposed wall cavities and studs. Use a good disinfectant to prevent mildew build-up. One cup of chlorine bleach mixed with a gallon of water works well. For a soapier cleaning solution, add a half cup of mild detergent. Wear rubber gloves.

If walls have already dried, work from the floor to the ceiling to prevent streaking. (Dirty water splashed on dry walls may be absorbed and become almost impossible to remove.) Overlap sections, cleaning the ceiling last.

#### ■ **Floors**

Before the house has dried out, scrub floors and woodwork with a stiff brush, plenty of water, a detergent and disinfectant. Carpeting soaked by contaminated floodwater should be removed and discarded unless it can be sanitized at a commercial facility for a cost substantially less than replacement. Vinyl flooring and floor tile may need to be removed to allow drying of subfloor.

Wooden floors should be dried gradually. Sudden drying could cause cracking or splitting. Some restoration companies can accelerate drying time by forcing air through the fluted underside of hardwood floorboards.

#### ■ **Once floors have dried**

Assess whether your floors can be repaired, replaced or recovered. Consider your time and budget as you make any decisions. If hardwood floors are damaged beyond repair, you may want to forego the cost of replacement and instead cover them with carpeting, vinyl, or linoleum. Or you might lay a new floor over the old, rather than replace it.

Plywood subfloors may have delaminated (separated) from excessive moisture, causing buckling. Sections may have to be replaced or have new plywood nailed over them. Consult a contractor for this work.

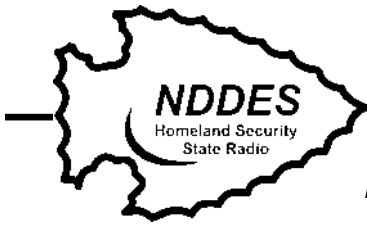
If buckling or warping has occurred, drive nails where the floor tends to lift or bulge. This will prevent further damage. Badly warped hardwood floors usually can't be repaired. Warped, wide pine board flooring, however, will often flatten out after it has thoroughly dried.

Plane or sand floors level. Do not refinish until thoroughly dry.

### ■ **Removing Mildew**

To remove surface mildew on walls or ceilings, use a mildew surface cleaner (available at paint stores) or: scrub the mildew with household detergent, then scrub with a solution of one-quarter cup bleach to 1 quart water. Rinse well with clean water. Once fully dry, apply a coat of paint containing an anti-mildew agent. To remove surface mildew on floors and woodwork, use a phosphate cleaning solution such as powdered automatic dishwashing detergent or trisodium phosphate (4 to 6 tablespoons to a gallon of water), available in hardware stores. Rinse with water, and when dry, apply a mildew-resistant finish.

*Source: NDSU Extension Service - <http://www.ag.ndsu.edu/disaster/flood/flood-damagedwallsceilingsandfloors.html>*



## **Flooded Farm Vehicles and Equipment**

### **■ Tips on Cleaning and Reconditioning**

Try to clean tractors, trucks and farm equipment as soon as possible. Delay will make dirt and silt harder to remove and may cause considerable rusting and corrosion. If you use farm vehicles and equipment before proper reconditioning, you may seriously damage them.

Have your dealer or another expert recondition engines. They need to be completely disassembled for cleaning and reconditioning. Do not try to move or start an engine that has been submerged until it has been cleaned and reconditioned, since dirt will damage bearings and precision parts. If the tractor was submerged only to the platform, you will need to service only the wheel bearings and moving parts that were under water.

### **■ Emergency Cleaning**

If you must use the tractor or engine immediately or if you think the cost of professional reconditioning is not worthwhile, use the following procedure. This procedure isn't thorough enough to prevent possible damage or need for overhaul in the future.

Clean exterior thoroughly with a hose. Scrub greasy deposits with solvent.

Remove spark plugs or fuel injectors, air cleaner, intake manifold and carburetor.

Clean these parts thoroughly with solvent.

Drain the crankcase. Flush the crankcase with oil and refill with clean oil.

Disconnect fuel lines, blowing them out with compressed air.

Crank the engine slowly with spark plugs or fuel injectors removed to force water out of cylinders. Squirt light lubricating oil into each cylinder and let it stand for about five minutes. Then crank the engine slowly to lubricate cylinder walls and rings.

Replace all filters -- engine, fuel, hydraulic.

Completely flush out the fuel system -- tank, pump, lines -- with #1 diesel fuel. Be extremely careful to avoid fire danger.

Replace starter and generator. Have an expert service them.

Drain and flush the transmission and final drive with solvent. Refill with new, clean oil.

#### ■ **Wheel Bearings, Cooling Systems and Batteries**

Remove and clean unsealed wheel and track bearings with solvent. Lubricate and replace the bearings. Factory-sealed bearings should not need cleaning if the seal is unbroken.

Flush the cooling systems with fresh water, and clean the radiator fins.

Replace the battery, if necessary. If it was submerged, it will probably need to be replaced.

#### ■ **Starting and Initial Operation**

Examine the machine and turn it over by hand after you have cleaned and replaced all parts. If it turns freely, it is probably ready for operation. Turn on the engine and operate the machine at low speed until you are sure all parts are working smoothly.

If there is a substantial amount of dirt in the crankcase, transmission or gear train, change the oil and oil filter after operating the machine for a few hours. Using fresh lubricant is cheaper than paying for additional repairs.

#### ■ **Additional Steps for Trucks and Cars**

Remove inside door panels. Clean and lubricate latches and window raising mechanisms.

Remove seats and floor mats. Brush and vacuum thoroughly. Clean washable surfaces with soap and water. Use rug or upholstery shampoo on non-washable areas. Dry thoroughly.

Disassemble leaf springs. Clean or replace spring pads if necessary.

Have brakes and steering mechanism checked before you drive the vehicle.

## ■ Reconditioning Flooded Farm Implements

Farm machinery covered by floodwater may be permanently damaged if it isn't reconditioned right away. Here are some general suggestions for reconditioning flooded farm machinery:

- Before putting the machine in service, thoroughly clean the exterior. Mud and silt can be removed by pressurized water. Brushing with fuel oil or kerosene may clean some silt deposits.
- Carefully assess how much of the implement was submerged.
- Overlubricate plain bearings and antifriction bearings equipped with grease fittings to flush out dirt and water with fresh lubricant. Either take a chance that sealed bearings are still sealed, or replace them. Remove, clean, lubricate and replace all wheel bearings.
- Turn the machine by hand to make sure all moving parts are free before applying power. Be sure they are completely dry before painting.
- Thoroughly clean and dry all belts before replacing.
- Prevent rust on brightly polished working parts by cleaning and applying a rust preventive coating.
- Don't tow a vehicle very far if it has been submerged, and don't attempt to start the engine. The engine should be removed and completely disassembled for cleaning. Have this done by a competent mechanic in a well-equipped shop. For a tractor that was not submerged deeper than the bottom of the chassis and has no water in the engine, you will need to service only wheel bearings and other submerged parts.

Relatively new equipment or that under warranty should be serviced by a competent technician. Here are additional tips for older but still serviceable equipment:

- Take diesel engines to your local dealer for inspection of fuel injection systems. Some small, older gasoline engines may be able to be serviced. Start with a thorough cleaning and servicing of the engine before attempting to start it.
- Drain crankcase oil, and remove the oil pan. Clean inside the engine with flushing oil or kerosene. Replace the oil pan, and fill the crankcase with a new lubricant. Install a new filter element.

- Remove cylinder head from any engine if floodwater has been near the level of the combustion chamber. Clean thoroughly, dry and replace. Then lubricate rings by putting oil on cylinder walls.
- Remove the carburetor, intake and exhaust manifolds; dry and clean if water has entered them.
- Have an authorized mechanic clean, dry and service all distributors, generators and starters that have been under floodwater.
- Remove a flooded fuel tank and flush clean.
- Drain the cooling system and flush with clean water. Clean mud from radiator fans with pressurized water.
- If brakes and clutches were under water, disassemble, clean and adjust.
- Drain the transmission, differential and steering gear housings. Flush with fuel oil and refill with a new lubricant.
- Clean, dry and repack all wheel bearings.
- Start tractor or engine. If it heats up, stop, and recheck your work.

**For renovating combines:**

- Clean up the auxiliary engine as previously explained.
- Thoroughly clean and dry V-belts and chains. Dip clean chains in oil, and drain before they are installed. Clean all pulleys and sprockets before chains or belts are replaced.
- On old equipment, if wooden straw walkers, shaker arms, rollers or other parts are badly warped, replace them.
- Thoroughly clean and dry inside of machine and bearings. Turn by hand to be sure all moving parts are free. Operate slowly after overgreasing to flush dirt from bearings. Sealed bearings may need to be replaced.

**The following points will help repair seeders and planters:**

- Clean and dry seed, fertilizer and pesticide boxes. Be sure seed tubes are open and loose in the boot at the disk.

- Remove all caked material from the fertilizer box or feed mechanism with a screw driver or scraper. Use fuel oil or penetrating oil to loosen stuck parts.
- Clean, dry and lubricate all transport and packer wheel bearings.
- Thoroughly clean and dry calibration mechanisms.
- Disassemble and inspect seed-drop mechanisms. Dry and remove all dirt. Be sure mechanisms operate freely.
- Clean and apply rust preventive to brightly polished working parts

**Source:** Iowa State University - <http://www.extension.iastate.edu/disasterrecovery/info/farmimplements.htm>



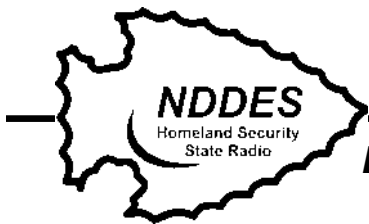
## ■ **How To Make Temporary Structural Repairs**

There's more to worry about than broken windows and leaking roofs when inspecting a house for flood damage. You have to make sure there's no live power in or around a house. Make doubly sure that main breakers at the service entrance are off. If you're in doubt, wait for the power company to come check it out.

Any temporary structural repairs that can be made will require some creativity since there's likely to be a shortage of materials. The most common repairs will involve nailing plywood or taping heavy plastic to broken windows, ceilings and walls.

### ■ **Tips**

- Check for structural damage to make sure the building is not in danger of collapsing.
- Turn off any outside gas lines at the meter or tank and let the house air for several minutes to remove foul odors or escaping gas. If you must enter at night, carry a battery-operated flashlight. Don't use a flame as a light source. Do not smoke.
- Shovel out mud while it's still moist to give walls and floors a chance to dry.
- Once plastered walls have dried, brush off loose dirt. Wash with mild soap and rinse with clean water; always start at the bottom and work up. Ceilings are done last.
- It's also important to clean out heating and plumbing systems.
- Clean metal at once, then wipe with a kerosene-soaked cloth. A light coat of oil will prevent iron from rusting.
- Flooded basements should be drained and cleaned as soon as possible. However, structural damage can occur by pumping out the water too quickly. After the floodwater around your property has subsided, begin draining the basement in stages, about one third of the water volume each day.
- If the building has shifted or the floors have settled badly, it may be necessary to install temporary bracing until extensive work can be done.
- To prevent flooded wooden floors from buckling and warping further, drive nails where the floor tends to lift or bulge.
- Remove loose plaster.
- After house is completely dry, repair damaged plaster on walls and ceilings. Badly damaged plaster walls can be resurfaced with gypsum board or plywood.



## **A Flood of Emotions**

*Water causes more than property damage in North Dakota. It is bringing a flood of emotions. How we deal with the emotional flood may affect how well North Dakotans recover from this natural disaster.*

### **■ Emotional Responses**

Most people are very quick to take care of what needs to be done: sandbagging, packing, and helping neighbors. "Let's take care of what can be done." At the same time people experience disbelief: "This can't possibly be happening!" This emotional duality allows people to keep working for survival. But there may be a sense of unreality during the disaster.

### **Other powerful feelings may surface:**

- Panic/feeling out of control
- Anger
- Generosity toward others
- Despair
- Anxiety/uncertainty
- Disorientation
- Cooperation/teamwork

At times, flood preparations can pull whole neighborhoods together by working, sandbagging, and preparing. There is a sense of teamwork. It can be an experience that helps people get to know each other in a special way.

The full force of the emotional flood will hit after the floodwaters recede. That's when exhaustion sets in. As people look at their real losses, they may experience grief, desperation, and depression. People need to be prepared to pay more attention to their emotional reactions and to the reactions of friends and neighbors once the emergency crews go home.

### **■ Coping**

One of first things people can do is pull together and don't hesitate to ask for assistance! Many people are around who want to help and will help. They just need to know what to do that will be most helpful right now.

Another important coping strategy is taking care of your physical and emotional needs. Eat a balanced diet to fuel your energy. As much as possible, get enough sleep. Fatigue will slow you down during an emergency. As you prepare, pack,

sandbag or check your crops, talk with others about your feelings. Listen to theirs. Together, look for the positives in the situation.

### ■ Talking Can Ease The Pain

Floodwaters will subside, but the emotional stress may keep rising for people who have experienced losses. Pain from loss and tough times can be eased when people keep talking with each other. Friends and neighbors, parents and children, and couples need to talk about what they are feeling.

When people stop talking with others who have suffered loss or who are facing financial trouble, they send the message that they don't care. Rather than feeling indifference, friends and neighbors may be caught up in their own losses, uncertainties, and problems. Those who were not hurt directly by the floods may feel guilty and not know what to say.

Children especially need help in regaining a sense of security. They may see changes in their parents and think that they are somehow to blame for increased tension. Talking together and being honest yet reassuring about problems the family faces can help children feel more in control.

If money is tight, parents can ask children to help think of ways the family can work together to keep expenses down. Parents need to be sure children don't blame themselves for tough economic times.

Couples who are facing losses may find that each spouse copes differently with the stress. No one reaction is right. The important thing is to keep talking things over and to show love and affection toward each other.

What matters most as people put their lives back together is friends, neighbors and families making themselves available for each other.

It can be harder to be a good listener than to provide the immediate kinds of help that have brought neighbors and strangers together in the crisis. Keeping in touch with the people who are hurting doesn't mean you have to have the answers. Just giving someone a chance to talk about the problem can be an important step in rebuilding.

### ■ Helping Others

As much as possible, provide practical help during the flooding. Help friends or family pack. Furnish meals. Store their belongings; provide them with a place to stay. Parents may be very busy; offer to spend some time with children to play and to listen to their concerns.

Listen. When others talk about their experiences and feelings, their emotional load seems lighter to bear. One of the best ways you can help is to just listen. You don't have to come up with solutions or answers. It's OK if your neighbor needs to break down and cry. Others will ask, "Why me?" They are not really looking for an answer but expressing their hurt.

Show by words and actions that you care. A friendly arm around troubled shoulders or a few words of support and encouragement can help in times of crisis. Small, kind deeds and sincere expressions of affection or admiration also will mean a lot.

### ■ **How Family Members Can Be More Supportive of One Another**

Tell family members when they have done a good job. Laugh! Laughter can help relieve tension. Be considerate of other family members. Express love and concern often.

### ■ **Neighboring in Times of Trouble**

Offer specific types of help or ask how you can help.

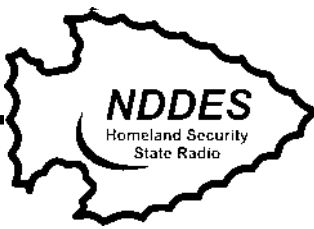
Go ahead and act. Don't be afraid of saying or doing the wrong thing.

Go ahead and help. Your friend won't resent you if you aren't facing flood danger yourself.

Keep helping. The danger may continue for some time. Recovering may take even longer. Your friends or family members will need regular, small acts of kindness to maintain their morale and to put their lives back together.

For emotional support, contact the Mental Health Association in North Dakota through the 24-hour statewide HELP-LINE at 211.

*Source: NDSU Extension Service - <http://www.ag.ndsu.edu/disaster/flood/floodofemotions.html>*



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*Ensuring a safe and secure homeland for all North Dakotans*

■ **Flooding and hazardous materials do not mix**

Household or business chemicals that may be hazardous can be identified by container warning labels. Some typical warnings include: **DANGER-CAUTION-POISON-WARNING-FLAMMABLE-TOXIC-HAZARDOUS-KEEP OUT OF THE REACH OF CHILDREN-AVOID CONTACT WITH SKIN.**

*Here is a list of some common hazardous products that might be found in homes and businesses:*

**Pesticides:** rat poison, flea powder, insecticides

Weed killers

Fertilizers

**Automotive products:** antifreeze, batteries, gasoline, motor oil, wax

Used motor oil

**Solvents:** degreasers, spot removers

Paint, paint thinners, lacquer

Photography materials

Rust removers

Medication

**Pressure vessels:** propane tanks, butane cylinders, aerosol cans

**Cleaning supplies:** oven cleaners, toilet cleaners, furniture polish, drain cleaners, silver polish, etc.

Fuel oil

Flammable liquids

*Source: Environmental Protection Agency*



## **Flooded Pesticides**

Some formulations and containers of pesticides can survive flooding without harm and be saved for future use. Others are ruined when wet and must be properly disposed of to minimize their potential harm. Pesticides may have contaminated waters in flooded areas. Everyone concerned should take responsibility to prevent further contamination.

### **■ Salvage**

Pesticides in unbroken, waterproof containers can usually be salvaged. Salvageable pesticides may include:

- Liquid concentrates in glass, metal, or plastic containers. If liquids have a milky appearance, water has probably leaked in, and the pesticide should be properly disposed of. Clear liquid concentrates are probably unharmed.
- Oil solutions such as livestock sprays designed for direct application without dilution, or oil based household sprays. Water can be readily seen in oil solutions. Separate the oil and water then return the spray to the original container.
- Pressurized cans or "bug bombs."
- Baits, powders, or granules in waterproof containers.

### **■ Labeling**

Labels on salvaged containers will probably be loosened by floodwaters. Labels should be firmly refastened to the containers. Unlabeled pesticides are dangerous to the handler and the environment, since there is the possibility that they might not be used correctly. If there is any question about the contents of a container, set it aside for disposal.

### **■ Disposal**

Dispose of any flooded pesticide dusts, wettable powders, or soluble powders packaged in paper or cardboard containers. If pesticides in these containers have become wet, chemical changes may occur, and the formulation may become hard and/or lumpy so that it cannot be properly suspended in water or used as a dust.

Use care when handling these containers, since they may be so weak and soggy that they will break when handled. Some pesticides may have unpredictable reactions in the presence of water. Properly dispose of any containers that can't be identified because of wet, illegible, or missing labels.

The recommended method for pesticide disposal is to preregister with the North Dakota Department of Agriculture to bring the pesticides to the next Project Safe Send collection program. Preregistration forms are available from the North Dakota Department of Agriculture or from NDSU Extension Service county offices. Call the North Dakota Department of Agriculture at (800)242-7535 for more information.

If unsure of the correct procedure for disposal, contact the regional EPA office, the state regulatory agency involved with pesticides, or the local Extension Service for directions and help in disposing of damaged pesticides.

### ■ **Safety**

Be aware of any illness arising after handling pesticides or pesticide wastes. Symptoms of pesticide poisoning frequently include headache, nausea, diarrhea, visual disturbances, excessive salivation or sweating, difficulty in breathing, weakness, tremor or convulsions.

Symptoms usually appear within 24 hours, although occasionally they may be delayed for several days. Consult the pesticide label or Material Safety Data Sheet (MSDS) for information regarding poisoning. See a doctor immediately or contact your local poison resource center if symptoms appear. Be sure to provide a copy of the label and/or MSDS to the doctor.

*Source: NDSU Extension Service - <http://www.ag.ndsu.edu/disaster/flood/floodedpesticides.html>*



■ **IS HOME-FROZEN FOOD SAFE TO USE?**

If your home freezer has been covered with floodwater, there is a good chance that seepage damaged the food inside. This food should be discarded even if no flood waters covered the freezer or seeped inside. Some foods may be unsafe due to power outage. The amount and type of food inside the freezer will determine whether it can be saved. A full, freestanding freezer will stay at freezing temperatures about two days; a half-full freezer about one day. How long the food in a freezer will stay frozen also depends upon:

- The kind of food in the freezer. For example, meat and other dense foods will not warm as fast as a freezer full of baked food.
- The temperature of the food. The colder the food, the longer it will stay frozen.
- The freezer. A well-insulated freezer with good gaskets will keep food frozen much longer than one with little insulation or poor gaskets.
- Size of the freezer. The larger the freezer, the longer food will stay frozen.

If the meat has been completely thawed and does not have a questionable odor, it should be used immediately. Meat, poultry and fish should be discarded if there are any signs of spoilage. Thawed foods can be safely refrozen in two situations. First, if it still contains ice crystals. Second, if it has thawed, but is still cold (about 40°F) and has been kept at refrigerator temperature not more than one or two days. Partial thawing and refreezing reduces the quality of foods, especially fruits and vegetables.

*Source: NDSU Extension - <http://www.aq.ndsu.edu/disaster/flood/ishome-frozenfoodsafetouse.html>*



## **Salvaging Food After a Flood**

### **■ Safety Measures in the Kitchen and Garden**

*Food that has come in contact with floodwaters is generally unsafe to eat. Floodwaters usually carry a high load of bacteria and filth with them, and may contain oil or chemical wastes as well. With the exception of canned foods and some produce, most food touched by floodwaters should be discarded. The safety of garden produce depends upon the type of flooding and type of produce. Follow the guidelines below, which also cover refrigeration and freezer concerns when the power is out. And remember: When in doubt, throw it out.*

### **■ Flooded Items to Discard**

- Fresh produce, meat, poultry, fish, and eggs.
- Opened containers and packages.
- Submerged, unopened glass jars that have cardboard lid liners, such as mayonnaise or peanut butter.
- Submerged, unopened, home-canned jars with broken seals. To check seal, remove ring and test the flat lid with fingertips. If the lid lifts off easily, discard the food.
- All food in cardboard boxes, paper, foil, cellophane, or cloth.
- Spices, seasonings and extracts, flour, sugar, and other staples in canisters.
- Cans that are dented, leaking, bulging, or rusted.

### **■ Flooded Items to Save**

- Some fruits
  - Vegetables
  - Unopened canned goods
  - Glass jars of food
- Sanitizing, and in some cases, cooking is necessary for safe use.**  
**To sanitize cans and glass jars of food:**
- Mark contents on can or jar lid with indelible ink.
  - Remove labels. Paper can harbor dangerous bacteria.
  - Wash jars and cans in a strong detergent solution with a scrub brush.
  - Immerse containers for 10 minutes in a solution of 2 tablespoons chlorine bleach per gallon of room temperature water.

Allow containers to air dry before opening.

Citrus fruits should be washed, sanitized with a light bleach

solution and peeled before eating.

Potatoes, carrots, apples and other firm fruits should be

sanitized, peeled, if possible, and cooked before eating. Do

not eat raw fruit or vegetables, even if they have been

sanitized.

## ■ **What About the Garden?**

Some garden produce may be salvaged. Sanitizing, peeling, and cooking is recommended. If it's not too late, prevent floodwater from coming into contact with food by:

- Raising refrigerators and freezers by placing cement blocks under their corners.
- Moving food from low cabinets.
- Moving canned goods and other food stored in the basement to the upstairs.
- If the floodwater contained waste from septic tanks, sewage lagoons, or a pasture, your garden will take about a month to become clean. Don't eat or preserve food during this time.
- Ask if your local health department will test the garden soil for harmful bacteria. It may be able to determine whether immature root crops are safe.
- Discard leafy greens such as lettuce, spinach, and cabbage, as well as soft berries. These are highly susceptible to bacterial contamination. Silt and other contaminants may be difficult to remove from them.
- Wash beans, peas, tomatoes, peppers and summer squash in water. Then soak in a weak chlorine solution of 2 tablespoons chlorine bleach to a gallon of water. Peel and cook them thoroughly before eating.
- For underground vegetables such as carrots and potatoes, wash in water and sanitize as above. Peel and cook them thoroughly before eating.
- Produce with a protected fruit or impervious outer skin, such as peas, melons, eggplant, sweet corn or winter squash, should be washed and disinfected before the outer shell, skin or husk is removed. Then shell, peel, or husk the produce and cook if possible.

## ■ **Refrigeration and Freezer Concerns**

If the electricity is off to the refrigerator or freezer, follow these guidelines:

- Discard refrigerated meats, seafood, milk, soft cheese, eggs, prepared foods and cookie doughs if they have been kept above 40 degrees F.

for over two hours. Also discard thawed items that have warmed above 40 degrees F., with the exception of breads and plain cakes.

- Discard any refrigerated items that turn moldy or have an unusual odor or appearance.
- Refreeze partially or completely frozen foods.
- Cold but fully thawed, uncooked meat, fish, or poultry should be checked for off-odor. If there is none, cook and eat or cook and refreeze.
- Discard combination dishes such as stews, casseroles, and meat pies if they are thawed.
- Refreeze thawed (but cold) juices, baked goods, and dairy items such as cream, cheese and butter.
- Do not refreeze thawed vegetables unless ice crystals remain. Cook and use them if there are no off-odors.

*Source: NDSU Extension Service - <http://www.ag.ndsu.edu/disaster/flood/salvagingfoodafteraflood.html>*