

Flood Resources

General Disaster Information

- Quick Reference Guide for Damage Assessment
- Local Resources – Where to Go for Assistance?
- Chain Saw Safety
- Standby Electric Generators
- Portable Generator Hazards
- Hiring a Contractor After a Disaster
- Insurance Coverage and Making a Claim
- Disaster Rehabilitation Assistance
- Stress and Decision Making After a Disaster
- Identifying Stress in Family and Others
- Helping Your Child Cope with Disaster

Tornado Resources

- Assessing Roof Damage After a tornado
- Assessing and Repairing Leaky Roofs
- Salvaging Food After a Tornado
- Electrical Systems and Appliances
- Flood-Damage Furniture and Appliances
- Cleaning Flood-Soiled Clothing and Bedding
- Disinfecting Dishes, Cookware and Utensils
- Cleaning and Repairing Flooded Basements

Flood Resources

- Assessing and Repairing Leaky Roofs
- Food and Water Safety During Hurricanes, Power Outages and Floods
- Salvaging Food After a Flood
- Cleaning and Repairing Flooded Basements
- Restoring Heating Systems After a Flood
- Flooded Private Sewage Systems
- Electrical Systems and Appliances
- Home Clean Up and Sanitation
- Cleaning Flood-Damaged Carpets and Rugs
- Flood Damaged Walls, Ceilings and Floors
- Drying and Repairing Walls
- Caring for Important Papers
- Flood-Damaged Furniture and Appliances
- Cleaning Flood-Soiled Clothing and Bedding
- Disinfecting Cookware and Utensils
- Water Contamination in Private Wells

Long Term Disaster Resources

- Emotional Recovery After a Disaster
- Surviving a Financial State of Emergency
- Restructuring Debt After a Disaster
- Communicating with Creditors
- Talking as a Family About Money
- Talking to Children About Money
- Income Tax Deductions for Property Loss
- Mold in your home: Cleaning Options

*Your county
extension office*



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Assessing and Repairing Leaky Roofs

SAFELY FIXING A WATERY PROBLEM

You may be anxious to stop a roof from leaking, but don't risk serious injury trying to inspect or repair it. First, try binoculars for a closer view. Next, check the attic for a drip trail. Leaks are rarely located directly above the water spot on the ceiling. When you find a leak in the attic, push a nail, straw or wire through it to help you or a repair person locate it outside.

If rain continues to be a problem and a repair person is unavailable, follow the directions at right for temporary relief. But be sure that only a physically able person gets on the roof for these emergency measures. Unsteadiness on the ladder or roof can lead to severe injuries.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

"Repairing Your Flooded Home," American Red Cross/Federal Emergency Management Agency, 1992.

TEMPORARY REPAIRS

Cover holes in the roof, walls or windows with boards, tarps or plastic sheeting. Nail down plastic sheets or trash bags with strips of wood and secure them with duct tape. If the holes are large, you may need to support the plastic in the center to keep it from ripping from the weight of the rain.

If sections of the roof or floors are sagging, have a contractor or other knowledgeable person brace weak areas. Improper bracing may increase damage and the chance of injury, so do not attempt this work unless you are experienced in structural repairs.

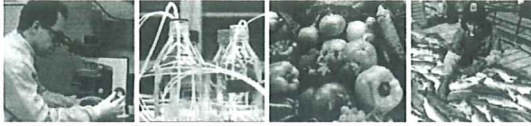
CAUSES OF LEAKS

Storm and wind damage are responsible for some roof problems. Others are caused by defective materials, faulty construction or gradual deterioration. Here are some common causes of leaks:

- ◆ *Defective flashing.* Flashing is the sheet metal used in waterproofing roof valleys, hips and the angle between a chimney and a roof. Wet spots near a chimney or outside wall may mean the leak is caused by defective flashing, narrow flashing or loose mortar joints. Look for corroded, loose or displaced flashing on sloping roof valleys and at junctions of dormers and roof.
- ◆ *Clogged downspouts or eaves.* Check for choked downspouts. Accumulated water or snow on the roof above the flashing may cause a leak. Ice accumulations on eaves sometimes form ridges, which cause melting snow to back up under the shingles.
- ◆ *Cracks and deterioration.* Roofing (especially wood or composition shingles) usually deteriorates first on southern exposures. Check southern slopes for cracking or deterioration.
- ◆ *Holes.* Missing shingles or holes in the roofing may be causing wet spots. To find holes, check for a drip trail or spot of light coming through in the attic. Stick a nail, straw or wire through the hole to mark the spot on the outside.

REPAIRING LEAKS

Methods of repair will depend on the kind of roofing and the nature and extent of the leak. Unless you are experienced, hire a professional roofer for this work. Missing shingles should be replaced, holes repaired and cracks filled. Whatever method is used, avoid walking on patched sections.



FOODFACTS

From the U.S. Food and Drug Administration

Food and Water Safety During Hurricanes, Power Outages, and Floods

What Consumers Need to Know

Emergencies can happen. When they do, the best strategy is to already have a plan in place. This includes knowing the proper food and water safety precautions to take if hurricanes — or other flooding/power outages — do occur.



Be Prepared for Emergencies

- 1. Make sure you have appliance thermometers in your refrigerator and freezer.**
 - Check to ensure that the freezer temperature is at or below 0 °F, and the refrigerator is at or below 40 °F.
 - In case of a **power outage**, the appliance thermometers will indicate the temperatures in the refrigerator and freezer to help you determine if the food is safe.
- 2. Freeze containers of water for ice** to help keep food cold in the freezer, refrigerator, or coolers in case the power goes out. If your normal water supply is contaminated or unavailable, the melting ice will also supply drinking water.
- 3. Freeze refrigerated items** such as leftovers, milk, and fresh meat and poultry that you may not need immediately. This helps keep them at a safe temperature longer.
- 4. Group food together** in the freezer. This helps the food stay cold longer.
- 5. Have coolers on hand** to keep refrigerated food cold if the power will be out for more than 4 hours.
- 6. Purchase or make ice cubes in advance** and store in the freezer for use in the refrigerator or in a cooler. Freeze **gel packs** ahead of time for use in coolers.
- 7. Check out local sources** to know where **dry ice and block ice** can be purchased, just in case.
- 8. Store food on shelves** that will be safely out of the way of contaminated water in case of flooding.
- 9. Make sure to have a supply of bottled water** stored where it will be as safe as possible from flooding.



Power Outages: During and After

When the Power Goes Out . . .

Here are basic tips for keeping food safe:

- Keep the **refrigerator and freezer doors closed** as much as possible to maintain the cold temperature.
 - The **refrigerator** will keep food **cold for about 4 hours** if it is unopened.
 - A **full freezer** will keep the temperature for approximately **48 hours** (24 hours if it is half full) if the door remains closed.
 - Buy **dry or block ice** to keep the refrigerator as cold as possible if the power is going to be out for a prolonged period of time. Fifty pounds of dry ice should hold an 18 cubic foot, fully-stocked freezer cold for two days.
- If you plan to eat refrigerated or frozen meat, poultry, fish or eggs while it is still at safe temperatures, it's important that each item is **thoroughly cooked to its proper temperature** to assure that any foodborne bacteria that may be present are destroyed. However, if at any point the food was above 40 °F for 2 hours or more — discard it.
- **Wash fruits and vegetables** with water from a safe source before eating.
- For infants, try to use prepared, canned baby formula that requires no added water. When using concentrated or powdered formulas, prepare with bottled water if the local water source is potentially contaminated.



Once Power Is Restored . . .

You'll need to determine the safety of your food. Here's how:

- If an appliance thermometer was kept in the freezer, **check the temperature** when the power comes back on. If the freezer thermometer reads 40 °F or below, the food is safe and may be refrozen.
- If a thermometer has not been kept in the freezer, **check each package** of food to determine its safety. You can't rely on appearance or odor. If the food **still contains ice crystals** or is 40 °F or below, it is safe to refreeze or cook.
- Refrigerated food should be safe as long as the power was out for **no more than 4 hours** and the refrigerator door was kept shut. Discard any perishable food (such as meat, poultry, fish, eggs or leftovers) that has been above 40 °F for two hours or more.



Keep in mind that perishable food such as meat, poultry, seafood, milk, and eggs that are **not kept adequately refrigerated or frozen** may cause illness if consumed, even when they are thoroughly cooked.

When Flooding Occurs — Keep Water Safe

Follow these steps to keep your **WATER SAFE** during — and after — flood conditions.

1. Use **bottled water** that has not been exposed to flood waters if it is available.
2. If you don't have bottled water, you should **boil water** to make it safe. Boiling water will kill most types of disease-causing organisms that may be present.
 - If the water is cloudy, filter it through clean cloths, or allow it to settle and then draw off the clear water for boiling.
 - Boil the water for one minute, let it cool, and store it in clean containers with covers.
3. If you can't boil water, you can **disinfect it using household bleach**. Bleach will kill some, but not all, types of disease-causing organisms that may be in the water.
4. If you have a **well** that has been flooded, the water should be **tested and disinfected** after flood waters recede. If you suspect that your well may be contaminated, contact your local or state health department or agricultural extension agent for specific advice.



When Flooding Occurs — Keep Food Safe

Follow these steps to keep your **FOOD SAFE** during — and after — flood conditions.

1. **Do not eat** any food that may have come into contact with flood water.
2. **Discard any food that is not in a waterproof container** if there is *any* chance that it has come into contact with flood water.
 - Food containers that are not waterproof include those with screw-caps, snap lids, pull tops, and crimped caps.
 - Also discard cardboard juice/milk/baby formula boxes and home canned foods if they have come in contact with flood water, because they cannot be effectively cleaned and sanitized.
3. Inspect canned foods and **discard any food in damaged cans**. Can damage is shown by swelling, leakage, punctures, holes, fractures, extensive deep rusting, or crushing/denting severe enough to prevent normal stacking or opening with a manual, wheel-type can opener.
4. Undamaged, commercially prepared foods in **all-metal cans** and **“retort pouches”** (like flexible, shelf-stable juice or seafood pouches) can be saved if you follow this procedure:
 - Remove the labels, if they are the removable kind, since they can harbor dirt and bacteria.
 - Brush or wipe away any dirt or silt.
 - Thoroughly wash the cans or retort pouches with soap and water, using hot water if it is available. Rinse the cans or retort pouches with water that is safe for drinking, if available, since dirt or residual soap will reduce the effectiveness of chlorine sanitation.
5. Sanitize cans and retort pouches by immersion in one of the two following ways:
 - Place in water and allow the water to come to a boil and continue boiling for 2 minutes, or
 - Place in a freshly-made solution consisting of 1 tablespoon of unscented liquid chlorine bleach per gallon of drinking water (or the cleanest, clearest water available) for 15 minutes.
6. Air dry cans or retort pouches for a minimum of 1 hour before opening or storing.
7. If the labels were removable, then re-label your cans or retort pouches, including the expiration date (if available), with a marking pen.
8. Food in reconditioned cans or retort pouches should be used as soon as possible thereafter.
9. Any concentrated baby formula in reconditioned, all-metal containers must be diluted with clean drinking water.
5. Thoroughly wash metal pans, ceramic dishes, and utensils (including can openers) with soap and water, using hot water if available. Rinse, and then sanitize them by boiling in clean water or immersing them for 15 minutes in a solution of 1 tablespoon of unscented, liquid chlorine bleach per gallon of drinking water (or the cleanest, clearest water available).
6. Thoroughly wash countertops with soap and water, using hot water if available. Rinse, and then sanitize by applying a solution of 1 tablespoon of unscented, liquid chlorine bleach per gallon of drinking water (or the cleanest, clearest water available). Allow to air dry.



Everyone can practice safe food handling by following these four simple steps:



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 at right, 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 salad dressing.
- ◆ 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, and unopened canned goods and glass jars of food can be salvaged. Sanitizing, and in some cases, cooking is necessary for safe use.

- ◆ To sanitize cans and glass jars of food:
 - a) Mark contents on can or jar lid with indelible ink.
 - b) Remove labels. Paper can harbor dangerous bacteria.
 - c) Wash jars and cans in a strong detergent solution with a scrub brush.
 - d) Immerse containers for 10 minutes in a solution of 2 tablespoons chlorine bleach per gallon of room temperature water.
 - e) Allow containers to air dry before opening.
- ◆ Citrus fruits should be washed, sanitized with a light bleach solution (see above) 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. Follow these guidelines:

PREVENTION IS THE KEY

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.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

"Repairing Your Flooded Home," the American Red Cross/Federal Emergency Management Agency, 1992.

UW-Extension Publications--

"Management of Food for Emergencies," (B3045);

"Quick Consumer Guide to Safe Food Handling," (BG248);

"When the Home Freezer Stops," (B2837);

"Keeping Food Safe," (B3474).

Cleaning and Repairing Flooded Basements

GETTING OUT WATER AND PREVENTING FUTURE PROBLEMS

Before you enter a flooded basement, take time to:

- 1) Turn off the electricity, preferably at the meter;**
- 2) Check outside cellar walls for possible cave-ins, evidence of structural damage or other hazards;**
- 3) Turn off gas or fuel service valves; and**
- 4) 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* are 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* are 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.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

"Repairing Your Flooded Home," the American Red Cross/Federal Emergency

Restoring Heating Systems After a Flood

ASSESSING DAMAGE AND GENERAL CLEAN-UP

Any heating system exposed to flooding should be professionally inspected, cleaned and reconditioned before reuse. Floodwater may have damaged heating equipment and undermined chimneys. If chimney cracks or leaks go unrepaired, your family is at risk of fire or carbon-monoxide poisoning.

Ask the service person if there is anything you can do to help before his or her arrival. Usually this will include turning off fuel and power to flooded units as a safety measure, and removing mud and debris from the furnace housing and inside the chimney. Leave things like inspection of oil storage tanks and cleaning of motors, blowers and other flooded parts to the professional. Flood insurance and federal disaster assistance programs usually will help replace flooded gas and oil appliances, including furnaces.

OIL AND GAS SYSTEMS

In general, any flooded parts should be professionally inspected and cleaned before turning the system back on. Check your owner's manual if you are unfamiliar with the system.

- ◆ If your furnace was flooded to the level of the burners, turn off the valve on the pipe leading to it. If burners were hot when flooded, parts may have cracked.
- ◆ Modern furnaces also have an electrical switch for blowers. Turn this off as well if any furnace parts were flooded.

OIL-BURNING SYSTEMS

- ◆ Have the storage tank inspected by an experienced person to make sure water and dirt have not entered.
- ◆ Have the electric motor, burners, blowers, fuel pump and gears cleaned and reconditioned by an expert. Flooded fuel filters should be replaced.
- ◆ Be certain that the fan motor, electric ignition systems and wiring are completely clean and dry before you turn on the electricity.
- ◆ If you have a hot water system, clean the fins on baseboard radiators. Clean any wall radiators.

LIQUID PETROLEUM AND NATURAL GAS SYSTEMS

- ◆ Some natural gas systems may have a valve to the pilot gas line, in addition to the main fuel valve. Turn both off if this is the case.
- ◆ Have a service person:
 - a) Check to see if water leaked into the controls or pressure regulator.
 - b) Clean and recondition all flooded equipment, including burner elements, electric controls and regulators.
 - c) Replace severely flooded electric blower motors.
- ◆ If you smell natural gas — which has a distinctive, putrid odor — leave your home and contact your utility company or a service person. Do not use open flames in the area.

ELECTRIC SYSTEM

Electric heating systems are part of electrical wiring system clean-up. Many local codes require that a licensed electrician do the work, or that a municipal inspector check the system before you turn the power back on.

If power isn't shut off to a flooded furnace system, shut the main switch off at the meter or remove the fuse to the furnace. (When touching switches, stand on a dry board and use rubber gloves or a dry stick to pull handles.)

Clean mud and debris from electric baseboard heating fixtures, being careful not to damage heating equipment. Have a professional handle cleaning and reconditioning of all working parts.

CHIMNEYS

A cracked, clogged or leaky chimney can cause fires or carbon monoxide poisoning. Be sure you check your chimney for dirt, debris and leaks before lighting the furnace or a fire. If flood damage has occurred, have a mason do an inspection and make repairs.

- ◆ Most chimneys have a foundation in the ground. If the chimney looks like it has settled or tilted, examine the footing to see whether it has been undermined.
- ◆ Have the chimney rebuilt if it has settled badly or is broken where it passes through floors or roof.
- ◆ If mortar in the joints between bricks has disintegrated, have a mason rejoin the chimney with cement.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

"Repairing Your Flooded Home,"
American Red Cross/Federal
Emergency Management Agency, 1992.

Pamphlets on heating systems from
your local utility company.

Flooded Private Sewage Systems

SAFETY, SANITATION AND CLEAN-UP CONCERNS

Flooding of a private sewage system can be a hazardous situation for homeowners. It may lead to a back-up of sewage in the home, contaminated drinking water and lack of sanitation until the system is fixed. While you don't have control over rainfall or flooding in your area, you can prepare for high water problems and respond appropriately to emergency flooding.

HOW PROBLEMS OCCUR

When flooding or saturated soil conditions persist, a private sewage system cannot function properly.

Soil treatment systems for wastewater rely on aerobic (with oxygen) regions to reduce the amounts of chemicals and living organisms (viruses, bacteria and protozoa). When the soil is saturated or flooded, those hazardous materials can enter the groundwater and your drinking water supply.

PREPARING FOR FLOODING

If you are prepared when flooding occurs, your family can be safe and your system should survive. To prepare for a flood you should:

- ◆ *Make sure all septic tanks are full of liquid.* The high-water season is not the time to have tanks pumped; empty tanks are buoyant and may “pop” out of the ground during flooding.
- ◆ *Plug floor drains, if necessary, to keep sewage from backing up into the basement.* Floodwaters may still enter the basement through cracks and seams, however.

DURING A FLOOD

- ◆ *Discontinue use of your private sewage system.* Use portable toilets, if possible, or use any large container with a tight-fitting lid for a temporary toilet. Line the container with a plastic bag. After each use, add chlorine bleach or disinfectant to stop odor and kill germs. If necessary, bury wastes on high ground far away from your well.
- ◆ *Remember that a well may become contaminated during a flood.* Therefore, **DO NOT DRINK THE WATER.** Drink bottled water, or disinfect water before drinking. Contact your local health department for disinfection instructions.
- ◆ *Do not bathe or swim in floodwater.* It may contain harmful organisms.
- ◆ *Shut off power to a sewage lift pump if you have one in the house or in a pump chamber (mound, in-ground pressure, at-grade systems).*

AFTER THE FLOOD

- ◆ *Do not use the sewage system until water in the disposal field is lower than the water level around the house.*
- ◆ *If you suspect damage to your septic tank, have it professionally inspected and serviced. Signs of damage include settling or inability to accept water. Most septic tanks are not damaged by a flood since they are below ground and completely covered. However, sometimes septic tanks or pump chambers become filled with silt and debris, and must be professionally cleaned. If tile lines in the disposal field are filled with silt, a new system may have to be installed in new trenches. Because septic tanks may contain dangerous gases, only trained specialists should clean or repair them. Wisconsin code requires licensed plumbers for any repairs.*
- ◆ *Discard any items that are damaged by contaminated water and cannot be steam cleaned or adequately cleaned and disinfected.*
- ◆ *Do not pump water out of basements too quickly. Exterior water pressure could collapse the walls.*
- ◆ *If sewage has backed up into the basement, clean the area and disinfect the floor with a chlorine solution of one-half cup of chlorine bleach to 1 gallon of water.*
- ◆ *Contact the county health department or county Extension office to obtain a drinking water test kit. (See the fact sheet "Water Contamination in Private Wells.") Do not drink the water until it has been tested and is safe.*

Additional resources:

Your county family living agent, your county code administrator, your local health department, the Wisconsin Bureau of Building Water Systems, Department of Industry, Labor and Human Relations.

Related publications:

UW-Extension publication "Care and Maintenance of Residential Septic Systems," (B3583).

Electrical Systems and Appliances

GENERAL CLEAN-UP AND WHAT TO DO BEFORE THE ELECTRICIAN ARRIVES

Restoring the electrical system and evaluating damage to appliances are high priorities after a flood. But before your electrical system is turned on, it should be thoroughly checked for short circuits by an electrician or other competent person. Ask your power supplier for advice and assistance.

Before entering your home after the flood, be sure that the electricity has been completely shut off. Appliances should not be operated until they have been thoroughly cleaned and reconditioned. Running equipment before it is properly cleaned could seriously damage it and may cause electrical shock.

ELECTRICAL CIRCUITS AND EQUIPMENT

Things to do before the electrician arrives:

- ◆ Have electricity shut off at both the meter and in the buildings. When touching switches, stand on a dry board and use a dry stick or rubber gloves to pull handles.
- ◆ Remove covers from all switches, convenience outlets, light outlets and junction boxes that have been under water.
- ◆ If a box is filled with mud, remove the screws that hold the receptacle or the switch in place. Pull receptacle, switch and wires out about two inches from box. Clean out all mud and dirt. Do not remove electrical connections. Leave boxes open for electrician.
- ◆ Remove all fuses and covers from entrance panel. Clean out all mud. Wires can be moved, but *do not disconnect*.

For some equipment, such as pumps, a temporary line can be installed by an electrician until the permanent wiring has a chance to dry.

ELECTRICAL APPLIANCES

Here are some general rules to follow:

- ◆ *Television sets and radios.* Professional cleaning is recommended for these types of appliances. There is a danger of shock because certain internal parts can store electricity even when the appliance is unplugged. Check the back for a warning label. Get a cost estimate before repairs to see if the appliance is worth saving.
- ◆ *Motorized appliances.* These include the washing machine, dryer, dishwasher and vacuum cleaner. Professional cleaning of the motor and other parts is recommended. However, you can clean the exterior surfaces in the meantime.
 - a) Use a heavy-duty cleaner and hot water to remove stains and silt deposits. Follow up with a rinse solution of 2 tablespoons chlorine bleach to each quart of water.
 - b) When removing gritty deposits, rinse your cloth in water frequently to avoid scratching enamel or metal surfaces.
 - c) Clean and disinfect dishwashers, washing machines and dryers only with water that has been declared safe to drink.

- ◆ *Refrigerators, freezers and ovens.* These appliances may have foam insulation and sealed components that suffer little water damage. But since they hold food, they should be cleaned, disinfected and checked by a professional or replaced. If replacement is recommended, get the opinion in writing and discuss it with your insurance adjuster before money is spent for a new appliance.
- ◆ *Heating appliances.* Disconnect hot water heaters and remove all panels and any flood-soaked insulation. Have an electrician or professional repair person clean and restore the unit to working order.
- ◆ *Lights and lamps.* Remove fixtures that were submerged. Clean outlet boxes, sockets and wiring. Floor or table lamps should be completely disassembled and cleaned. Damaged cords and plugs should be replaced. Consider taking lamps to an appliance shop unless you are familiar with these repairs.

GROUNDING

All metallic appliances that have been flooded should be properly grounded to prevent electric shock. Mud or dirt in a grounded outlet or adapter may prevent the grounding system from working, and you could be electrocuted. If you are unsure if your electrical system is properly grounded, call an electrician.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

"Repairing Your Flooded Home," the American Red Cross/Federal Emergency Management Agency, 1992.

Home Clean-Up and Sanitation

SAFELY CLEANING A FLOOD-DAMAGED HOME

Clean-up priorities will vary depending upon the kind and seriousness of damage to your home. But assuming major concerns such as structural safety, basement flooding, and electrical and water systems have been addressed, clean-up can begin inside.

Start cleaning your furnishings as soon as possible. Your aim should be to thoroughly dry and clean the house before trying to live in it or have permanent repairs made. Early efforts should include taking furniture, rugs, bedding and clothing outside to dry and prevent mildew.

SET PRIORITIES AND KEEP SAFETY IN MIND

As you begin clean-up, focus on accomplishing the most important tasks first. Resist over-exerting yourself.

- ◆ Give special attention to cleaning children's toys, cribs, playpens and play equipment. Boil any items a toddler or baby might put in his or her mouth. Discard stuffed toys, water-logged toys and non-cleanable items.
- ◆ Keep chemicals used for disinfecting and poisons used for insect and rodent control out of children's reach.
- ◆ Wear protective clothing on legs, arms, feet and hands while cleaning up debris.

GENERAL RULES FOR CLEANING AND DISINFECTING

- ◆ Wash exposed skin frequently in purified water. Wear rubber gloves to protect against contamination and skin irritation.
- ◆ Try using a pump-up garden sprayer or hose to remove layers of mud from hard surfaces.
- ◆ Scrub with a household cleaner/detergent solution and a brush to remove remaining surface oil. Rinse with clean water.
- ◆ Wash with a disinfectant, such as chlorine bleach, pine oil or a phenolic product, such as Lysol. Remember, a product is considered to be a "disinfectant" only if it is labeled as such. Rinse well.
- ◆ Dry items thoroughly to prevent mildew growth.
- ◆ Sanitize dishes, cooking utensils and food preparation areas before using them (see fact sheet, "Disinfecting Dishes, Cookware and Utensils").

REMOVING MOLD AND MILDEW

- ◆ Brush off mold and mildew growth on household items outdoors to prevent scattering of spores in the house.
- ◆ Vacuum floors, ceilings and walls to remove mildew. Then wash surfaces with a detergent/household cleaner and water solution.

- ◆ Wipe mildew-stained areas with a cloth dampened with a solution of 1 cup of chlorine bleach or rubbing or denatured alcohol to 1 gallon water. Pine-based or phenolic products also work well.

PREVENTING MILDEW GROWTH

- ◆ Use an air conditioner, dehumidifier or heater, if available, to remove moisture. Use fans to circulate air and open all windows.
- ◆ Turn on electric lights in closets and leave doors open to dry the dampness and humidity.
- ◆ Spray with a fungicide or other mildew preventive product. Read and follow instructions and precautions on product label. Dry thoroughly.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

"Repairing Your Flooded Home," the American Red Cross/Federal Emergency Management Agency, 1992.

Cleaning Flood-Damaged Carpets and Rugs

WHEN TO DISCARD, CLEAN OR CALL A PROFESSIONAL

GENERAL RULES

When faced with flood-damaged carpeting and rugs, your options will depend on the source of flooding. If floodwater consisted of clean basement seepage or lawn runoff into a sub-basement, drying and cleaning is an easy decision. But if sewage-contaminated floodwater has covered your carpeting, you probably will need to discard it for health safety reasons. You can assume the water and the carpet contain infectious organisms. Throw rugs can usually be saved.

Wall-to-wall carpeting, most large area rugs and any rug with foam backing should be discarded if flooded with contaminated water. Except for valuable rugs, the time and expense of professional cleaning generally is not worth the effort or the health risk.

If you are determined to salvage carpeting soaked with contaminated water, consult a professional cleaning company that services carpets at its own cleaning and drying facilities. A steam cleaning (hot-water extraction) method is preferable.

A wall-to-wall carpet soaked by clean rainwater can be salvaged. Have it professionally cleaned or clean it using the directions below.

Throw rugs usually can be cleaned adequately in a washing machine.

CLEANING RAIN-SOAKED CARPETS

Cleaning basement carpeting indoors is not a good idea in summer because you are adding even more moisture to an already wet area. If the carpeting is installed with tack strips you may be able to remove it, have it cleaned and reinstalled. Padding is nearly impossible to clean so it should be replaced.

If you can't remove the carpeting, dry it as quickly as possible to minimize growth of mildew. If possible, use a wet/dry vacuum system. A dehumidifier can help remove moisture from the air. Keep windows closed when using a dehumidifier.

When the carpet is thoroughly dry, vacuum the area.

Shampoo and repeat the drying process. Keep in mind that most modern carpeting is made of nylon and should not be treated with bleach.

Vacuum again.

You can reduce a musty smell with the following process:

- a) Sprinkle baking soda over the carpet, working it in with a broom or sponge mop.
- b) Leave the baking soda treatment on overnight.
- c) Vacuum the baking soda out. Vacuum twice, moving back and forth in a different direction the second time.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

"Repairing Your Flooded Home," American Red Cross/Federal Emergency Management Agency, 1992.

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.

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.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

"Repairing Your Flooded Home," American Red Cross/Federal Emergency Management Agency, 1992.

UW-Extension Publications—

"Removing Water From the Building Materials of a Water Damaged Home;"

"High Humidity After Water Damage and the Growth of Mildew and Mites."

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.

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. (See previous section.)
- ◆ 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.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

"Removing Water From the Building Materials of a Water-Damaged Home," University of Wisconsin-Extension, Madison, 1994.

"Repairing Your Flooded Home," American Red Cross/Federal Emergency Management Agency, 1992.

TIPS on Repairing or Rebuilding Your Disaster-Damaged Home, FEMA, 1981.

Caring for Important Papers

STEPS TO TAKE BEFORE AND AFTER A FLOOD

Valuable papers and records should be given maximum protection from any disaster. Water- and fire-resistant file cabinets are available for storing some records at home. A commercial storage area, such as a safe-deposit box, will assure protection from theft and physical damage.

Consider making copies of your valuable papers for selected professionals, family members or friends, to assure their prompt availability when needed. Lists of all such documents and the location of each should be stored in more than one place.

If important documents or books have been damaged by floodwater, follow the instructions outlined here for drying. However, it is a good idea to photocopy any important papers as a precautionary measure. Even if papers appear to have dried successfully, they may disintegrate rapidly because of substances in the floodwater.

KEEP AN UP-TO-DATE HOUSEHOLD INVENTORY

An inventory of household items and other property is especially valuable in case of a disaster. When making the inventory, do not overlook items kept in cabinets, closets, the freezer, garage and yard. Consider making a video of your inventory and property; at minimum, take some photographs. An accurate inventory will help determine if you have enough insurance to cover the contents of your home. Whenever possible, record the date of purchase and purchase price of items. Keep the inventory current.

PAPERS TO BE STORED IN THE HOME

Keep the following papers stored at home in a water-proof, fire-proof, locked box:

Family advisors' names and addresses

Educational, employment and health records

Copies of birth and marriage certificates, insurance policies

Driver license numbers, income tax returns, current bank balances, loan payment books

Guarantees and warranties, appliance manuals, rental property records

Household inventory, safe-deposit records, one copy of a list of valuable papers and their locations

PAPERS TO BE STORED IN A SAFE-DEPOSIT BOX

Keep the following papers stored in a safe-deposit box, especially during a disaster:

Property records, deeds, titles and/or leases

Copies of wills (his and hers); birth, death and marriage certificates; divorce decrees; adoption or custody papers; citizenship papers; passports; military service records

Stocks records, bond certificates, contracts (including promissory notes), supporting documents of years of large transactions, unusual losses or deductions

List of insurance policies, automobile bills of sale and titles, social security cards

- ◆ Government savings bonds, religious records, retirement papers, copyrights and patents
- ◆ Household inventory, one copy of a list of valuable papers and their locations

DRYING PAPERS AND BOOKS

Dry papers and books slowly for best results. Photocopy valuable papers as a precautionary measure because flood-damage may cause rapid deterioration. If you don't have the time to clean and dry them immediately, consider putting them in the freezer to prevent mildewing. Place wax paper between layers of paper bundles or books so they can be separated easily when removed.

- ◆ Wipe book covers with a solution of one part rubbing or denatured alcohol and one part water.
- ◆ Place books on end with leaves separated. When partially dry, pile and press books to keep pages from crumpling. Alternate drying and pressing until books are thoroughly dry. This helps prevent mildew. Use a fan to hasten drying.
- ◆ If papers and books are very damp, sprinkle pages with corn starch or talcum powder to absorb moisture. Leave powder for several hours, then brush it off.
- ◆ For valuable books that are nearly dry, consider pressing the pages with an electric iron set on low. This is a tedious process, but may be worth the effort. Separate the pages to prevent musty odors.
- ◆ Some chemicals help stop mold growth. Contact your county Extension office for recommendations on use.
- ◆ When books are thoroughly dry, close them and use C-clamps to help them retain their shape. Wipe vinyl and leather book covers with a light coating of petroleum jelly or leather or vinyl dressing.

Additional resources:

Your county family living agent

Related publications:

"Repairing Your Flooded Home," the American Red Cross/Federal Emergency Management Agency, 1992.

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. (See the fact sheet, "Electrical Systems and Appliances.") 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 are 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 reglued. Wood alcohol or turpentine applied with a cottonball 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.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

“Repairing Your Flooded Home,”
American Red Cross/Federal
Emergency Management Agency, 1992.

Cleaning Flood-Soiled Clothing and Bedding

WHAT TO SALVAGE AND HOW TO CLEAN IT

Unfortunately, cleaning your flood-soiled clothing and bedding is not the same as doing the usual family wash. Items need to be sanitized as you wash them. And your washing machine may be flood-damaged, making machine washing out of the question until you can get to a laundromat or friend's house. Nevertheless, you can help prevent mildew damage to clothes and bedding by sorting and drying items as soon as possible.

Even if your washing machine was not flooded, avoid using it until you know that the water is safe enough to drink and that your sewer line works. Before you wash clothes in the machine, run it through one full cycle. Be sure to use hot water and a disinfectant or sanitizer, such as chlorine bleach.

CLOTHING

When cleaning flood-damaged clothing:

- ◆ Separate wet items as soon as possible to keep clothing colors from running together. Sort out clothing that should be drycleaned.
- ◆ Take clothes and linens outdoors and shake out dried mud or dirt. Hose off extremely muddy items to avoid clogging your drain when you wash. If you don't have access to water, simply dry things out.
- ◆ If possible, soak badly soiled items overnight in cold water and detergent. Wring out and air dry if you're unable to machine wash right away.
- ◆ Check the labels on clothes and linens, and wash them in detergent and warm water if possible. Adding chlorine bleach to the wash cycle will remove most mildew and will sanitize the clothing. Because bleach fades some fabrics and damages others, use other sanitizers, such as pine oil cleaners, as necessary.
- ◆ If an item is still stained after washing, rewash before drying. Drying may make some stains more difficult to remove.
- ◆ Items to be drycleaned should be air-dried and taken to a cleaner as soon as possible.

Furs and leathers are usually worth the cost of professional cleaning. If you want to clean leather yourself, wash the mud off and dry the leather slowly. Keep it away from heat or sunlight while drying.

BEDDING

Bedding should be hung out to dry as soon as possible. Once dry, brush off excess soil and dirt. Pillows, while washable, usually should be discarded if soaked with contaminated floodwater.

- ◆ *Sheets and pillow cases.* Put sheets and pillow cases through two complete washing cycles. Use diluted liquid chlorine bleach to help kill germs. Follow your usual drying procedure.
- ◆ *Blankets.* Put washable blankets (acrylic, cotton) through two complete washing cycles. Air dry or use an automatic dryer at proper temperature settings. Put wool blankets through a drycleaning process either at a commercial coin-operated facility or drycleaning plant. Shrinkage and the difficulty of thorough cleaning make wool blankets troublesome to wash.
- ◆ *Quilts and comforters.* Wash or dryclean depending on fiber content of the bedding. Usually, it is best to wash cotton quilts.

MATTRESSES

As a general rule, inexpensive mattresses are not worth the expense of professional sanitizing and reconditioning. They should be discarded.

- ◆ In some cases, a good inner spring mattress may be worth the cost of reconditioning. Get an estimate from commercial facilities.
- ◆ If the outside of the mattress is only slightly damp, brush off surface soil and wipe with a cloth wrung out of a solution of one cup denatured or rubbing alcohol and one cup water.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

"Repairing Your Flooded Home,"
American Red Cross/Federal
Emergency Management Agency, 1992.

Disinfecting Dishes, Cookware and Utensils

SAFETY GUIDELINES AFTER A DISASTER

During a disaster such as a flood, tornado or fire, kitchen items easily can become contaminated. Floodwaters may contain silt, raw sewage, oil or chemical wastes, while fires may leave residues from toxic fumes or fire-fighting chemicals. Before using any item that has come in contact with these substances, follow the guidelines at right.

DISASSEMBLE, WASH AND DISINFECT

Take apart any item that can be cleaned in pieces. If possible, remove handles from pots. If you have a dishwasher and the hot water temperature is at least 140 degrees F., use a long wash cycle and heated drying cycle to clean and disinfect dishwasher-safe items. Regarding other items, or all items if you don't have a dishwasher, follow these steps:

- ◆ Wash all items in a strong detergent solution. Use a brush to remove dirt. Rinse in hot water.
- ◆ Immerse glass, porcelain, china, plastic dinnerware and enamelware for 10 minutes in a disinfecting solution of 2 tablespoons of chlorine bleach per gallon of hot water.
- ◆ Disinfect silverware, metal utensils, and pots and pans by boiling in water for 10 minutes. Chlorine bleach should not be used in this case because it reacts with many metals and causes them to darken.
- ◆ Air-dry dishes. Do not use a towel.
- ◆ Discard and replace soft, porous plastic or wood items saturated by floodwater, since they cannot be sanitized. These include baby bottles, nipples and pacifiers.
- ◆ If cupboards and counters come in contact with floodwater, clean and rinse them with a chlorine bleach solution before storing dishes.

Additional resources:

Your county family living agent, the American Red Cross, the Federal Emergency Management Agency

Related publications:

"Repairing Your Flooded Home," American Red Cross/Federal Emergency Management Agency, 1992.

Water Contamination in Private Wells

REPAIR, CLEAN-UP AND DISINFECTION

Wells that have been overtopped by floodwater pose a number of immediate dangers, from electrical shock to serious water-borne illnesses. Therefore, do not turn on your pump after flooding has occurred and do not drink or wash with well water. Your well and pump need to be inspected after a flood. Your well also needs to be properly disinfected and its water tested for safety.

WELL AND PUMP INSPECTION

Swiftly moving floodwater can carry large debris that could loosen well hardware, dislodge well construction materials or distort casing. Coarse sediment in the floodwaters could erode pump components. In some cases, floods may cause some wells to collapse. For all these reasons, you should have professionals inspect your system.

- ◆ *Electrical system.* Do not turn on the equipment until the wiring system has been checked by a qualified electrician, well contractor or pump contractor. If the pump's control box was submerged during the flood, all electrical components must be cleaned and dry before electrical service can be restored. Get assistance in turning the pump on from the well or pump contractor.
- ◆ *Pump operation.* All pumps and their electrical components may be damaged by sediment and floodwater. The pump, including the valves and gears, needs to be cleaned of silt and sand. If pumps are not properly cleaned and lubricated they can burn out. Get assistance from a well or pump contractor who can clean, repair and maintain different types of pumps.
- ◆ *General cleaning of drilled, driven or bored wells.* To avoid damage to the well, have the contractor remove mud, silt and other debris from around the well top. If excessive mud, silt or sediment has entered the well, the pump may need to be removed before cleaning can take place.
- ◆ *Dug wells.* Do not attempt to disinfect or use a dug well that has been flooded.

PUMPING THE WELL

After the contractor services and cleans the well, pump it until the water runs clear to rid the well of floodwater. Depending on the size and depth of the well and extent of contamination, pumping times will vary. If the water does not run clear, get advice from the county or state health department or Extension service.

EMERGENCY DISINFECTION

After flooding, a well must be disinfected to kill bacteria and other potential disease-causing organisms. Wells that are less than 50 feet deep may be contaminated even if there is no apparent flood damage. The following steps apply to drilled, driven or bored wells only. Disinfection should not be attempted for dug wells.

- ◆ *Follow the instructions above for pumping the well.*
- ◆ *Prepare a chlorine solution.* Approximately 8 quarts of 5.25-percent (or 5 quarts of 10 percent) chlorine bleach such as Hilex, Clorox, etc., should be mixed with 100 gallons of water. It is best to prepare more solution than the amount of water standing in the well; if this amount is unknown, the 100-gallon measure is a safe estimate. Most garbage cans hold 30 gallons or more; therefore, filling three (clean) cans with the solution is sufficient.
- ◆ *Pour or pump the solution in the well in one continuous flow.* Attach a hose to a faucet and, making certain the hose itself is clean, place the other end of the hose into the well. Open the faucet and recirculate the chlorinated water for one hour, washing down the inside of the casing and pump piping. Faucets in your house should be opened until you detect a chlorine smell, then close them.
- ◆ *Allow the chlorine solution to remain in the well and piping for at least 24 hours, preferably longer.* The system should then be purged free of chlorine. Since it can disrupt a septic system, the chlorinated water should be run outdoors, perhaps into a ditch. It may kill grass and shrubs, and should not be run into a lake or stream.

SAMPLING AND TESTING

Once all flooded wells have been disinfected, wait one week to have the water sampled and tested by a state-certified laboratory or health department. Do not drink the water until two consecutive tests come back safe.

- ◆ If the laboratory issues sterile bottles for sampling, carefully follow all instructions for their use.
- ◆ If the test comes back unsafe, disinfect.
- ◆ If the test comes back safe, retest in two weeks.

Unfortunately, your well may not be a safe source of water for months after extensive flooding or high groundwater. Wastewater from malfunctioning septic tanks or chemical seepage can contaminate the groundwater even after water was tested and found to be safe. You need to take long-range precautions, including repeated testing, to protect the safety of drinking water. Keep in mind that even under normal conditions, all private wells should be tested annually.

Additional resources:

Your county Extension office, the Wisconsin Department of Natural Resources, the Wisconsin Department of Health and Social Services

Related publications:

UW-Extension publications—

"Drinking Water Contamination: Understanding the Risks," (G3339);

"Maintaining Your Home Well Water System," (G3399);

"Home Water Safety," (G3558, 1-5).
DNR publication, "Bacteriological Contamination of Drinking Water."