How to clean up after a flood

Colorado State University Cooperative Extension

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SAFETY OF REFRIGERATED FOODS AFTER A POWER FAILURE

1) Most chopped meats, poultry and seafood sandwich fillings should not be left without refrigeration for more than 2 hours. If you have to leave your home without an ice chest containing ice, take cold ingredients for any salads and toss (mix) them and when you arrive at the shelter where you are staying during the emergency, eat immediately. If there is any salad left, throw it away.
2) You can extend your food supply by cooking all unspoiled meat immediately. Large, solid, unboned pieces of fresh beef or lamb such as rump roast or leg of lamb are least susceptible to quick spoilage.
3) Uncured sausage is vulnerable to contamination because it is free of preservatives. Keep it frozen until you "must" leave, and then cook before it is completely thawed.
4) Raw chopped meats like hamburger spoil quickly. Pork, fish, and poultry spoil quickly. Dispose of them. Do not trust your sense of smell.
5) Hard cheese usually keeps well at room temperature. Other cheeses such as cream cheese, opened containers of cheese spreads, and cottage cheese spoil quickly. Throw out when off-flavor develops. If surface mold develops on blocks of cheese, slice ½ inch below the surface and discard.
6) Milk spoils quickly without refrigeration. Throw out spoiled milk.
7) Custards, gravies, creamed foods, chopped meat, poultry and seafood sandwich fillings spoil quickly when refrigerated and provide ideal growing places for organisms causing food poisoning. Dispose of these foods if they have warmed to room temperatures. Spoilage is difficult to detect since there may be no offensive odor or taste.
8) Commercially made baked goods with cream fillings are not safe to take when evacuating unless you have a cool place to keep them. It is best to leave cream pies and all foods containing high protein and moisture at home unless you store them in a cooler with ice.

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FLOOD CONTAMINATED FOODS

Contaminated food may be a problem following any storm involving flooding.

Flood waters may carry silt, raw sewage, oil, or chemical wastes. Filth and disease bacteria in flood water will contaminate food, making it unsafe to eat.

Thoroughly inspect any food left in the house after a flood. Flood water may have covered it, dripped on it, or seeped into it. Even though some foods (see below) are protected by their containers, if you are in doubt about the safety of a food, throw it out rather than risk disease.

Use the following guidelines when deciding which foods to discard and which to save.

Food to discard

Do not attempt to save the following foods:

1) Opened containers and packages which have come in contact with flood waters.
2) Unopened jars and bottles with paper waxy seals such as those contaning mayonnaise, or salad dressing.
3) Containers of spices, seasonings, and flavorings.
4) Flour, grains, sugar and coffee in canisters or bags.
5) Paper, cloth, fiber or cardboard boxes, even if the contents seem dry. This includes salt, cereals, pasta products, rice, and any "sealed" packages of crackers, cookies or mixes, within a larger paper box.
6) Dented seams, bulging or rusty, leaking tin cans. Cans which have been tossed about and are found far from their normal storage spot. Seams on these cans may have been weakened or their seals broken, causing contamination or spoilage.
7) Jam or jelly sealed with paraffin.
8) Containers with non-sealed, fitted lids, such as cocoa or baking powder.
9) Commercially bottled carbonated beverages, if the cap is crusted with silt; don't attempt to wash, since pressure in bottles may cause an explosion.
10) Foil or cellophane packages.
11) All fresh vegetables and fruits
12) Fresh meat, fish, and poultry which have been in contact with flood waters.
13) Home-canned foods, even if the jar seems tightly sealed.

Food to keep

The following foods are safe if you wash, sanitize containers and cook foods before use:

Undamaged tin cans. Be sure to wash and sanitize container (see below) before opening the can. For added safety boil food before using.

To disinfect cans

All cans free of rust or dents must be washed and sanitized before they are opened.

1) Remove labels and wash in a strong detergent solution with a scrub brush. Remove all silt.

2) Immerse scrubbed containers for 15 minutes in cold (60-70°F) chlorine solution. Household bleaches contain from 2% to 6% chlorine. The amount of bleach to add to water would depend on the percent chlorine it contains:

% chlorine in bleach	Volume of bleach to add to 1 quart water	Volume of bleach to add to 1 gallon water
2%	2 teaspoons	2 tablespoons
4%	1 teaspoon	1 tablespoon
6%	½ teaspoon	2 teaspoons

3) Remove containers from solution, and air-dry before opening. Re-label if possible. Use as soon as possible, since containers may rust. Store containers where they will not be re-contaminated.

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FLOODED GARDEN PRODUCE

If floodwaters have covered a garden, some produce will be unsafe to eat. The safety of unharvested fruits and vegetables will depend on:

1) kind of produce
2) maturity of produce at the time of flooding
3) time of year flooding occurred: possible recurrence of flood in same week.
4) severity of flooding (depth of water and silt)
5) duration of flooding
6) bacterial content of floodwater
7) likelihood of contamination from sewage or other bacterial contaminants

Immature produce

In general, fruits and vegetables, which were more than 2 weeks immature at the time of flooding, should be safe to eat by the time they are ready for harvest. For additional safety, disinfect produce (see below) and cook it before eating.

Mature produce

Unless flooding was light and there is no danger of bacterial contamination from floodwater, avoid using fruits and vegetables that were ready for harvest at the time of flooding. Unless they can be disinfected, peeled, and thoroughly cooked. Some fruits such as tomatoes, cucumbers, summer squash, strawberries, and peppers would be highly susceptible to bacterial contamination.

1) Leafy vegetables such as lettuce, cabbage, mustard, kale, collards, spinach, swiss chard, celery, and fleshy vegetables and berry fruits such as tomatoes, cucumbers, summer squash, strawberries, and peppers would be highly susceptible to bacterial contamination.

Don't pick contaminated strawberries unless there was a quick recession of floodwaters and a lot of immature fruit at time of flooding (2 weeks before ripening).
Silt and other contaminants might be imbedded in the leaves, petioles, stems or other mature openings of fleshy structures, and could be difficult to remove.

2) Root, bulb and tuber crops such as beets, carrots, radishes, trumps, onions, and potatoes would be less susceptible to bacterial contamination. Disinfect these vegetables. Peel, and cook them thoroughly before eating.

3) Produce with a protected fruit or impervious outer skin such as peas, melons, and eggplant. Or winter squash should be washed and disinfected before the outer shell, skin or husk is removed, Them shell, peel, pr husk the produce, and cook it if possible.

Covered sweet corn would mold and should be discarded.

Disinfecting measures

Thoroughly wash and disinfect any produce before eating.

1) Wash in a strong detergent solution with a clean scrub brush. Remove all silt.

2) Immerse produce for 15 to 20 minutes in a chlorine solution. Household bleaches contain from 2% to 6% chlorine. The amount of bleach to add to water depends on the percentage chlorine it contains;

% chlorine in bleach	Volume of bleach to add to one quart of water	Volume of bleach to add to one gallon of water
2%	¾ tablespoon	2 tablespoons
4%	1 teaspoon	1 tablespoon
6%	½ teaspoon	¾ tablespoon

3) Rinse thoroughly with safe drinking water.

4) Peel, if possible, and cook thoroughly before eating.

Refer any specific questions to health authorities or your county Extension agent.

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CONTROLLING INSECTS

After a natural disaster — especially one involving flooding — mosquitoes, flies and other insects may be more abundant than usual, posing potential health problems. Filth and debris left by the storm create excellent breeding conditions for house flies and mosquitoes, some of which may be capable of spreading typhoid, dysentery and encephalitis. To control insects it is important to remove their breeding places (any standing water, especially stagnant water). In warm weather this should be done immediately after you return to the premises.

Eliminate breeding spots

1) *Empty water from barrels, old tires, cans, and other vessels.* (This water may also be polluted by floodwaters and may be a health hazard, in addition to being a breeding place for insects.) Also, check clogged gutters and flat roofs which have poor drainage. Make sure cisterns, cesspools, septic tanks, fire barrels and rain barrels are covered tightly.

2) *Wherever possible drain ponds, pools, or any standing water in which mosquitoes may breed.*

3) If drainage is impossible, treat water puddles still standing after a week with larvicide oil as recommended by a county Extension agent.

4) *Dispose of refuse.* Bury animal carcasses as soon as possible. Bury or burn garbage at least once every week. Be sure garbage cans have tightly fitting lids. When using manure and garbage as a fertilizer, spread it thinly so it will dry quickly and not support fly development.

Repair

Patch screens and other places where mosquitoes may enter buildings. Paint screens with an insecticide solution recommended by your county Extension agent.

Spray

Use a household spray or an aerosol bomb to kill mosquitoes, flies, or other insects that get into buildings. Do not apply oil-based sprays to flowers or ornamental plants. Spray shrubbery and shaded areas of buildings to kill adult insects. Contact your county Extension agent for specific recommendations.

Use a repellent

If possible, keep small children indoors, especially in the evening. Persons who must go outside at dusk should use a repellent on exposed parts of the body and clothing.

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PRIORITIES FOR CLEAN-UP AND REPAIR

Priorities will vary with kind and seriousness of damage. Buildings may not be habitable during repair.

Before purchasing cleaners and disinfectants take inventory of what needs to be cleaned — walls, floors, appliances, etc. Buy *only* cleaning products for type of work to be done.

1) Take photos of flood damage for insurance claims and tax deductions. Keep record of all expenses.

2) Assemble a "bare essentials" first aid kit for minor injuries which may occur while cleaning.

3) Examine building structure. Check foundations for settling, cracking or undermining. Examine walls, floors, and windows to determine what repairs are necessary. You may want to repair only temporarily until extensive work can be done.

4) If basement is flooded, start pumping the water in stages. Pump about a third of the water each day.

5) Get electrical system in operation. If switch box is in a flooded basement, do not turn electricity back on until water has been pumped out. Take electrical appliances to a serviceman as soon as possible.

6) Get water system in operation. Disinfect wells and water system.

7) Shovel out mud and silt before it dries.

8) Before they dry, wash down flooded walls and floors with a hose. Start at bottom and work upward.

9) Scrub and disinfect walls and floors.

10) Start heating system, if possible, to speed up drying. Before operating it, heating system may need to be cleaned, dried and reconditioned. Make sure chimneys are clean before starting system.

11) Dry out walls and floors. If necessary for proper drying, strip walls open up to water level. Drill holes in exterior siding. Complete drying may take months.

12) Repair buckled walls and floors

13) Make decisions about saving or discarding household contents. Clean and dry household items, furniture, carpets, clothing, dishes, bedding. Disinfect when necessary.

14) Treat items for mildew as needed.

15) Care for damaged trees, shrubs, and lawn.

16) Repaint, repair, refinish as necessary.

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SUPPLIES AND EQUIPMENT FOR HOME CLEAN-UP

Cleaning supplies

Enzyme products
Detergents
Bleaches
Disinfectants
Ammonia
Scouring powder
Rubber gloves
Strong boots or heavy soled shoes

Equipment for small jobs

Buckets
Tools (crowbar, hammer, screwdriver)
Sponges and cloths
Scrub brushes
Scoops
Throw-away containers for garbage, and container to carry water to street
Water hose

Equipment for large jobs

Buckets
Tools
Brooms
Shovels
Hoes
Sponge mop or mop that is easily squeezed out
Water hose
Wheelbarrow
Dolly
Bushel baskets
Wash tubs (for soaking objects)

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CLEANERS AND DISINFECTANTS

1) Household cleaners help remove dirt. Disinfectants help stop the growth of disease-causing microorganisms carried in floodwater.

2) Powdered or liquid cleaners and disinfectants are more practical and much less expensive than aerosol products, since large areas will probably need to be cleaned.

3) Buy cleaners and disinfectants in the largest sizes available to reduce their cost. Farm supply, hardware, wallpaper and paint stores often have these products in gallon or pound containers.

4) All products are not suited for all uses. Before using any cleaner or disinfectant, refer to its label for specific directions or precautions. Make sure the product will do the job you want it to.

5) Many household cleaners and disinfectants are harsh on hands and may burn the eyes. Protect your hands with waterproof gloves. Avoid contact with eyes. If you splash or spill any product on your skin, wash it off immediately.

CLEANERS AND DISINFECTANTS

TYPE OF CLEANER*	USES	PRECAUTIONS	ADDITIONAL SUGGESTIONS
All purpose detergents (Tide, Wisk, Cheer) or soap (Duz)	Moderately or heavily soiled washable, color-fast textiles. On furniture and appliance surfaces. Painted walls and woodwork and wallpaper. Floors, rugs, and carpets	Do not use on wool, silk or fabric containing these fiber blends.	Rinse well to remove suds.
Enzyme products (Biz, Axion)	Helpful on tough stains, ground-in dirt and grass stains, restoring whiteness to fabrics	The use of chlorine bleach will inactivate enzymatic action when both products are used.	
Liquid household cleaner (Top Job, Ajax, Janitor in a Drum) Powdered household cleaner (Spic 'n Span, Ajax, Comet, Bon Ami)	Removes mud, silt, and greasy deposits from hard surfaces such as painted walls floors, woodwork, porcelain.	Dilute with water as directed on container for specific uses.	
Household ammonia	Hard surfaces: windows, walls, woodwork, floors, tile, porcelain	Dilute in water. Do not get in eyes. May irritate skin. Do not combine with chlorine bleach.	
Tri-sodium phosphates (TSP)	Wood walls, wood work, floors.	Powder. Dilute in water. Do not get in eyes. May irritate skin. Do not combine with chlorine bleach.	For mildew removal, combine 8 to 10 tablespoons tri-sodium phosphate and 1 gallon water.

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MILDEW-REMOVING PROCEDURES

PROBLEM	HOW TO DEAL WITH IT	MATERIALS AND TRADE NAMES*	WHERE AVAILABLE	PRECAUTIONS	ADDITIONAL SUGGESTIONS
Upholstered furniture	Remove padding. Dry. Plan to reupholster. Throw away all cotton stuffing.			To protect exposed wood dry in sun *short* time only.	Dry thoroughly. Use fan and indirect heat.
Rugs	Consult professional rug cleaner. Home care — sponge with thick suds. Rinse. Dry. Spray with fungicide.		Grocery stores Drug stores		Suspend rugs for drying if possible.
Wood furniture	Clean while still wet. Wash with suds. Wipe with alcohol and water solution. Dry away from direct sun and heat.	Rubbing or denatured alcohol	Grocery stores Drug stores Variety stores	Do not dry in sun.	Dry in warm place with ventilation. Wait 4 to 6 weeks before refinishing.
Floors, woodwork and other woods	Dry wood with heat and ventilation. Wipe off mildew. Scrub with solution of washing soda or trisodium phosphate.	Spic and Span Washing soda — Tri-sodium phosphate — 6 TBS per gallon of water	Paint stores Grocery stores		May be repainted with mildew-resistant paint. This paint contains fungicide. Do not use on children's cribs, playpens or toys. Rinse. Dry 6 weeks before repainting.
Books	Stand books on end. Spread out pages to dry. Wipe off mildew. After a few hours, stack and press to avoid wrinkling. Alternate opening and stacking until completely dry. Sprinkle talcum powder or cornstarch on pages to absorb moisture.	Moth crystals. Various trade names. Chemical name is para-chlorobenzene.	Grocery stores Drugstores	Avoid breathing fumes from moth crystals.	Books may be frozen until you have time to work with them. Place books in closed container with moth crystals to stop mold growth. A fan or heater may hasten drying. Can apply low heat with electric iron.
Basements	Sweep up dirt and debris. Scrub with disinfectant solution. If mildew odor persists, sprinkle bleaching powder over floor. Leave until floor is dry. Sweep	Disinfectants Clorox Purex Bleaching powder — chloride of lime or chlorinated lime	Grocery stores Farm supply stores	Bleaching powder is poisonous. Follow precautions on label. Keep away from children and pets. Will cause spots on concrete floor.	

*Where trade names are used, no discrimination is intended and no endorsement by the Cooperative Extension Service is implied.

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DISINFECTANTS AND SANITIZERS	USES	PRECAUTIONS	ADDITIONAL SUGGESTIONS
Quaternary (Roccal, Zephrin, Crew, End-Bac) (Available in janitorial, dairy and poultry supply houses.)	Laundry-safe for all fibers. Helpful in removing musty odors on floors and walls.	May cause some color change.	Add at beginning of rinse cycle.
Pine oil disinfectants (Fyne Pine, Texize-O-Pine)	Laundry-safe for washable clothing	Do not use on wool or silk. Pine odor will linger on these fabrics.	Add before putting clothes in machine, or dilute in 1 quart water.
Liquid chlorine disinfectants (Clorox, Purex)	Use as rinse on carpets and furniture or in laundry to disinfect or to control mold. Follow instructions for use with colored fabrics.	Do not combine with ammonia. *Follow instructions.* Bleach can ruin many items. Do not use in rinse water. Do not use on aluminum or on linoleum.	Add bleach before putting clothes in washer or dilute in 1 quart water.
Phenolic disinfectants (Pine-Sol, Al-Pine, Lysol)	Laundry-safe for washables. Bathrooms, plastic or ceramic tile floor.	Do not use on wool or silk.	Add in wash or rinse cycle.

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CLEANING AND REPAIRING FLOODED BASEMENTS

Entering

Before you enter a flooded basement:

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.

4) Open doors and windows, or use blowers to force fresh air into the basement.

Pumping

Do not use an electric pump powered by your own electrical system. Use a gas-powered pump, or one connected to an outside line. Fire departments in some communities may help with such services.

More damage may be done by pumping water from the basement too soon or too quickly, than from letting the floodwater remain. 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 up.

To help prevent such structural damage, pump the water from the basement in stages. Remove about a third of the water each day. Watch walls for signs of failing. If the outside water level rises again after the day's pumping, start with a new water line. The soil may be very slow to drain, but do not hurry the pumping. Whatever is submerged in the flooded basement will not be damaged further by delaying the pumping; serious structural damage may be prevented.

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 one of these sanitizing solutions:

1) *Chloride of lime* (25% available chlorine). Dissolve a 12-ounce can in 2 gallons of water.

2) *High test hypochlorite* (65% available chlorine). Stir 5 ounces into 2 gallons of water.

Oil stains in basements caused by overturned or damaged oil tanks may also be a problem following flooding. Commercial products (such as Neutroda) will help neutralize fuel oil. Products are available 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, and let it set.

Repairing

Check supporting columns, beams, walls, and floors. Structural damage to flooded basements usually includes buckled walls, settled walls, or heaved floors.

1) *Buckled walls* are evidenced by horizontal cracking and walls moving out of plumb. 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, rebuild the damaged parts immediately. Build pilasters into walls over 15 feet long for reinforcement. Pilaster spacing should be 12 to 15 feet.

2) *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.

3) *Heaved floors* are those that have not returned to their original level, or have cracked badly. You may need to construct a new floor:
a) Remove old, broken concrete.
b) Place 6 inches of gravel fill on the basement floor surface.
c) Cover area with a polyethylene vapor barrier.
d) Lay a 4-inch concrete floor with mastic joints between the floor and walls. The floor should be reinforced with steel. Welded wire reinforcement placed at mid-height in the slab is a minimum reinforcement.

If a floor is badly cracked, but has returned to its original level, and if there is sufficient headroom, place a new floor over the old one. Add a vapor barrier 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. Remove the mud as soon as possible to avoid rotting joists or foundation wood.

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CLEANING FLOODED FLOORS AND WOODWORK

Cleaning

1) Shovel out the worst of the mud and silt before it dries. Use a hose if necessary.

2) Before the house has dried out, scrub floors and woodwork with a stiff brush, plenty of water, a detergent, and a disinfectant. Remove mud and silt from corners, cracks, and crevices.

3) Water may have accumulated in partitions and exterior walls. Drain these areas by removing baseboard and drilling holes between studs a few inches above the floor. You may need to remove sections of the wallboard or plaster so that wall studding and interior can dry thoroughly — a process that may take months.

4) Give floors a final thorough washing with a non-sudsing cleaning product.

Removing surface mildew

1 Heat the room to a temperature of 50° to 60°F. to help dry mildewed wood.

2) Scrub mildewed floors and woodwork with a mild alkali solution such as washing soda or tri-sodium phosphate (4 to 6 tablespoons to a gallon of water), available in paint and grocery stores. Or use a cloth dipped in hot water and a small amount of kerosene, or in a mixture of borax dissolved in hot water.

3) Rinse with clear water.

4) Allow wood to dry thoroughly.

5) Apply a mildew-resistant paint.

6) Replace badly infected wood, preferably with treated or decay-resistant wood.

Bleaching wood stained by mildew

1) Remove paint or varnish with paint remover.

2) Apply a solution of 3 tablespoons oxalic acid dissolved in a pint of water to the stains. (Oxalic acid crystals can be purchased at drug stores. *Oxalic acid is poisonous. Label it clearly and keep out of children's reach.)*

3) Rinse with clear water.

4) Dry thoroughly before refinishing.

Refinishing

You may prefer to have floors professionally refinished. If you decide to do the work yourself:

1) Be sure floors are thoroughly dry.

2) Sand the surface until it is clean and smooth. (Heavily planed floors may never look good again, but they can serve as a base for carpeting, tile or sheet flooring.)

3) If floor is oak, apply a filler; then apply two coats of a penetrating floor seal or spar varnish. Sand between coats.

4) Apply varnish, following directions on can.

5) Treat fir flooring in the same way, but omit the filler.

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TREATING WARPED AND DE-LAMINATED FLOORS

Some warped wood flooring is repairable and some is not. The extent of damage will depend partly on the kind of material used in the floor. Different woods react differently to dampness or flooding.

Plywood

Many homes have plywood subfloors. Plywood usually separates (de-laminates) from excessive moisture. This will make the covering material (carpet, sheet-flooring or tile) buckle.

If only a small section of the subfloor has separated, replace that section with new plywood. If the entire floor has de-laminated, either remove the entire subfloor and replace it, or renail new plywood over the old. Consult a reliable contractor for this work.

Hardwood

Badly warped hardwood floors usually can't be repaired. If the floor is obviously beyond repair, take it up and discard it. Allow subflooring to dry for several months before installing another floor over it.

To repair slightly warped hardwood floors:

1) Clean and dry the floor completely before attempting any repairs. This may take weeks or even months.

2) If the floor is still warped in places when it is dry, remove strips adjacent to the bulges, and plane them on their edges. This will give space for the warped boards to flatten out in time. (If boards are tongue and groove, consult a carpenter about the special techniques necessary for this work.)

3) You may be able to draw some buckled flooring into place by nailing the bulged spots. Some humps may be removed by planing or sanding. Heavily planed or sanded floors, though unsuitable to be used uncovered, can serve as a base for new flooring, or for carpet or resilient floor covering.

Pine

Warped wide pine board flooring will often flatten out after it has thoroughly dried. Clean the floor and let it dry for several months. Using the furnace as much as possible during the drying time will speed up the process. (Do not build fires to hasten drying.) Do not try to repair the floor until it is dry. If any boards are still slightly warped when dry, use the same technique as for warped hardwood floors (see 1 to 3 above).

When laying a new floor or subfloor, remove baseboards and moldings. The finished floor should be the same level as the original floor, if possible. If floor level changes, doors must be refitted to the new level. Consult a carpenter before attempting this work.

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DRYING WALLS

Inner walls

Walls must dry from the inside out. The interior framing of walls should be allowed to dry thoroughly. Sometimes this process takes weeks or even months. To release water and mud from walls remove top and bottom strips of siding on the outside of the building. Drill several holes in walls near the inside floor line.

The total drying time will depend partially on the amount of dry air that can circulate through the studding (called "chimney action"). To provide for maximum chimney action, first consider the construction of the building:

Fire stops or cross bracing

These are horizontal or diagonal braces between the vertical supports or studs.

Cross bracing will prevent chimney action between the studding. However, cross bracing is not usually found in modern construction, except in two-story houses where it has been specified. To allow free air movement, remove interior or exterior wall covering wherever cross braces are located. To check for cross bracing or fire stops, extend a stiff wire into the wall cavity.

Insulation

Most types of insulation will be ruined if water soaked. you will probably have to replace flood-soaked insulation.

1) *Loose fill* (such as vermiculite) will settle to the bottom of walls. As it dries it can be removed. If not removed, loose fill insulation will create odors and eventually cause decay of the studding.

2) *Rock wool batting* insulation will also bunch and settle. If it is absorbent it will create odors and could eventually cause studding decay.

3) *Fiberglass batting* will also bunch, but will not develop odors. Its insulating value will be greatly reduced.

4) *Reflective surfaces* (such as aluminum foil) will probably lose their reflective ability, thus decreasing their insulating effectiveness. The material itself should be undamaged.

Wall coverings and finishes

1) *Plaster* will take weeks or even months to dry, but may not be ruined by water. Old plaster, however, may disintegrate after being wet for a long time.

2) *Dry wall* (plaster board) will warp and disintegrate in water. Warping above the water level can also be expected. Drywall that has been submerged must be replaced.

3) *Laminated paneling* (plywood, masonite) will separate and warp above and below the water level. The extent of damage will depend on how long the paneling was submerged, and how quickly moisture is removed from the studding. Slow drying decreases the possibility of delamination.

Siding

1) *Masonry* will dry slowly but will be undamaged except for possible cracking or settling. Open inside walls to prevent mildew and decay of wooden supports.

2) *Lapped siding* (wood, asbestos, aluminum). Remove strips or sections to dry insulation and studding. The type of sheathing will determine drying rate. To prevent oxidation, make sure backing of aluminum siding is dry.

Sheathing (material between studding and finish siding)

1) *Wooden boards* will dry slowly and some will warp. If possible, renail warped areas before they dry. Replace those that are too badly warped to salvage.

2) *Sheathing board* is usually absorbent and will be difficult to dry. Some will disintegrate or separate and must be replaced.

3) *Plywood* will probably separate in places 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 subjected to frequent flooding.

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CLEANING INTERIOR WALLS

1) If walls have been flooded, hose them down, if possible, while they are still damp to remove most of the mud and silt.

2) Scrub with a sponge and warm detergent solution or a commercial cleaner. Clean a small section of the wall at a time.

3) To get rid of the stench that often accompanies flooding, rinse with a solution of 2 tablespoons sodium hypochlorite laundry bleach (such as Purex or Clorox) to a gallon of water. Repeat the scrubbing and rinsing several times if necessary. Household disinfectants such as Lysol can also be used. Follow directions on container.

4) Work from the floor to the ceiling to prevent streaking. Rinse with an old bath towel wrung out in clear water. Overlap sections.

5) Clean the ceiling last.

6) Allow walls to dry thoroughly before repainting, repairing plaster, papering, or applying any wall covering. Four to 6 weeks should be allowed as a minimum drying time. Total drying time will depend on weather conditions. You may need to remove baseboards or sections of the walls to dry interior studding and insulation (see fact sheet, *Drying Walls).*

7) If mildew appears on walls, scrub with a solution of trisodium phosphate, a disinfectant, or a solution of ½ cup bleach and ½ cup mild detergent in a gallon of warm water.

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REPAIRING EXTERIOR SIDING

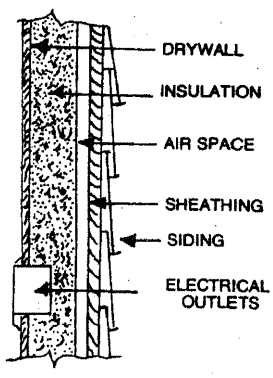
1) *Strip drywall and insulation from inside wall.* Replace with new material with moisture barrier on the inside. (Insulation can cause skin irritation. Wear protective skin covering when working with it.) Clean electrical outlets, and check wiring.

2) *Check for silt deposits in crevasses back of siding.* If crevasses are filled with silt, remove siding, and clean out all silt. Silt left in crevasses will trap moisture, causing mold and peeling paint.

3) *Check for cracked or warped siding.* If only a few boards are warped or cracked, replace them individually. If all siding is warped, cover entire wall with new material. You can install new siding over old, if there are no silt deposits behind old siding. This will also help improve insulation.

4) *Cover or replace warped siding.* It is easiest to cover warped horizontal beveled siding with new vertical siding, and to cover warped vertical siding with horizontal siding. Installing new siding over old will require trim work around doors and windows. Consult a carpenter for installation details. Siding is available in vinyl, aluminum and wood. Wood siding may be either natural or pre-finished. Vinyl and aluminum siding are permanently colored.

CROSS SECTION OF WALL



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RECONDITIONING FLOODED ELECTRICAL APPLIANCES

Do not try to use washers, refrigerators or other large electrical appliances until they are checked by a serviceman. Attempting to run equipment before it is properly cleaned could seriously damage it. The manufacturer's authorized dealer has detailed information for inspection and repair of his particular equipment, and should be called for repair if possible.

Follow these general procedures if you must do your own repairs:

Motorized appliances (refrigerators, freezers, washers, dryers)

1) Remove the electric motor, if possible, and take it to an electrical repair shop. If the motor can't be removed, follow instructions to recondition it. (See fact sheet, *Reconditioning Flooded Electric Motors).*

2) Remove dirt from insulation and dry insulation thoroughly. Insulation may have been ruined from wetting. It may develop bad odors or lose its insulating ability, depending on exposure time in water. If so, the appliance will probably have to be discarded. Some newer sealed units may be unharmed by water.

3) Clean up outside of unit, and recondition the controls. Replace all bad wiring.

4) Clean gear housings and shafts in washing machines with kerosene. Clean bearings. Wipe metal surfaces with a kerosene-soaked rag to remove rust and dirt. Coat metal surfaces thinly with oil.

Heating appliances

1) Disconnect electricity and flush appliance with clean water.

2) Aerosol cleaning products (like Quik-Kleen) are available for cleaning hard to reach places in motors. Spray on parts and wipe or flush off. Do not use on contacts.

3) The insulation on hot water heaters may be soaked. Remove all panels, and if possible, the tip of the heater. The insulation may never dry satisfactorily.

4) Clean and dry thermostat and wiring. Apply rust inhibitor to all metal parts.

Lamps and lights

1) Be sure electricity is disconnected.

2) Remove fixtures that were submerged. Clean outlet boxes and wiring (see fact sheet, *Restoring Electrical Service After a Flood).*

3) Clean fixtures and dry out wiring.

4) Clean dirt from sockets.

5) Completely disassemble and clean floor or table lamps. Clean wiring, sockets, and switches.

6) If a switch cannot be opened for cleaning, replace it.

7) Replace all damaged cords and plugs.

Electrical cords

1) Throw away any damaged or fabric-covered cords.

2) Rubber-covered cords in good condition (with no cracks in the rubber) can probably be reconditioned as follows:
a) Remove connections from both ends.
b) Peel back rubber covering until inside braid is dry.
c) Cut off damaged part of cord.
d) Clean up plug and receptacle; connect to cord or replace.

Grounding

All metal appliances should be grounded when in use to prevent electric shock. This is especially important with washers, dryers, ranges, waffle irons, dishwashers, portable drills, saws, and grinders. Attach a wire from the frame of the appliance to a water pipe or to the ground wire in the extension cord.

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RECONDITIONING FLOODED ELECTRIC MOTORS

Electric motors in appliances that have been flooded should be thoroughly cleaned and reconditioned before they are put back into service. If possible, have this work done by a serviceman. If service is unavailable, follow these instructions:

1) Turn off electric power to motor.

2) Mark wires so they can be reconnected to the motor.

3) Mark end bells with a file or chisel. Remove through-bolts and end bells.

4) Identify and mark any internal wiring so it can be replaced when motor is reassembled. The capacitor (condenser usually in a round mounting on top of the motor) will also need to be disconnected and replaced before it is used.

5) Wash dirt, sand, sediment and other foreign matter from all parts of the motor, particularly from the windings. Use a hose with water on low pressure, or pails of water.

6) Clean bearings (except sealed bearings) with a petroleum base cleaning solvent. *Do not use gasoline or carbon tetrachloride.*

7) Thoroughly dry the motor windings and capacitor. This can be done with a controlled temperature oven, heat lamps over the motors, or make-shift tunnels directing heat to the motor from charcoal, blowtorches, or gas heaters.

Some motors may have older insulation. In these motors, temperature of the windings should not exceed 170°F. (When the temperature of the shell is approximately 170°F. it can be touched quickly by hand.)

Total drying time will depend on the depth of the windings and the temperature of the inside areas. A minimum of 4 to 8 hours is average. (If windings are not thoroughly dry, the motor may short circuit when electricity is turned on.) If windings are firm and stiff it is probably safe to put the motor back in service.

8) When reassembling motor, lubricate bearings.

9) Reconnect all internal and external wiring.

10) Put a time delay or delayed action fuse, such as Fusetron or Fustat in the line. The fuse should be 10 to 25 percent larger than the running amperage of the motor. A thermal switch in the circuit or a circuit breaker will serve the same purpose.

Spin motor by hand to make certain it turns freely before connecting it to the electrical circuit.

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CLEANING FLOOD-SOILED PILLOWS AND MATTRESSES

MATTRESSES

A good innerspring mattress should be sent to a commercial renovating company. However, even after renovating, the flood odor may not completely leave the mattress. Renovation is too difficult to do at home. Ask about the cost of such work. It could be less expensive to buy a good reconditoned or new mattress.

If a mattress must be used temporarily, scrape off surface dirt and expose it to sunlight to dry as much as possible. Cover mattress with a rubber sheet before using it.

If you decide to keep any flood-soiled mattress, it should be sterilized. This must be done at a sterilizing plant — a mattress company or a state hospital. Ask your local public health department or county Extension agent for information on mattress sterilizing plants in your area.

Have mattresses as dry as possible before taking them to a sterilizing plant. Crop drying fans or household fans may speed up the drying process.

PILLOWS

Feather pillows

Washing feathers and ticking together. If ticking is in good condition, wash feathers and ticking together.

1) Brush off surface dirt.

2) To circulate water through pillows, open a few inches of the seam in opposite corners of the pillow, turn edges, sew loosely with strong thread, or fasten with safety pins.

3) Wash in machine or by hand in warm (not hot) suds 15 to 20 minutes. Use a disinfectant in the wash cycle. If using an automatic washer, do not wash more than two pillows at a time.

4) Rinse at least three times in clear, warm water.

5) Spin off water or gently squeeze out as much water as possible. Do not put pillows through wringer.

6) Dry in an automatic dryer at moderate heat setting, or dry in a warm room with a fan, or across two or three clotheslines. Put several bath towels in dryer with pillows to speed up drying. Allow at least 2 hours. Shake up feathers occassionally to hasten drying.

Washing feathers and ticking separately. If ticking is not in good condition, or if pillow is badly soiled, wash feathers and ticking separately.

1) Find a muslin bag which is two or three times larger than the ticking.

2) Open one edge of ticking.

3) Sew open edges of the ticking and the bag together.

4) Shake the feathers from ticking to muslin bag.

5) Close seam of bag.

6) Wash bag of feathers in lukewarm, sudsy water and disinfectant.

7) Repeat if necessary.

8) Rinse in lukewarm water, changing water several times.

9) Squeeze out as much water as possible by hand. Do not use a wringer.

10) To air-dry, hang on line by two corners. Change position end to end and shake feathers occasionally to speed up drying.

11) Finish drying pillows by laying them on a flat surface or pinning them to a clothesline to dry in the open air.

12) Wash the ticking. With a sponge, apply a starch solution to the inside of the ticking.

13) Transfer clean feathers to the clean, sanitized starched ticking, using the same methods as for emptying.

14) Close seam of ticking.

If pillows have been badly soaked, it may not be possible to remove all objectionable odors.

Polyester fiberfill pillows

1) Brush off surface dirt.

2) Wash by hand in warm water and low-sudsing detergent. Add a disinfectant to the wash water. Flush water through pillow by compressing it. (Twisting and wringing will tear filling.) Change water and repeat if necessary.

3) Rinse three times in clear, warm water.

4) Spin off water in automatic machine. Tumble dry in dryer at moderate setting with several bath towels, or press out as much water as possible by hand, and hang on line outdoors to dry.

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Foam rubber or urethane pillows

1) Remove cover. Brush off surface dirt.

2) Follow manufacturer's directions if they are available. Otherwise, soak in cool water; then wash in warm suds by hand. Use a bathtub or large sink. Then wash by pushing down on pillow, releasing, and pushing down again. Rinse the same way. Pillows can be machine-washed on gentle cycle with lukewarm water plus a disinfectant.

3) Rinse well in lukewarm water.

4) Gently squeeze or spin out excess water. Blot with towels.

5) Dry away from heat or sunlight. Do not dry in dryer unless on an "air only" setting. Pillows may dry very slowly in the air.

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CLEANING FLOOD-SOILED BLANKETS, QUILTS, COMFORTERS, LINEN

Blankets, quilts, and comforters

Wash only one blanket, quilt, or comforter at a time.

1) Shake and brush to remove surface dirt. Follow manufacturer's laundering directions if available. Otherwise, proceed as follows.

2) Soak at least 15 minutes in lukewarm water, turn two or three times during soak period. Several soak periods may be beneficial depending on the amount of soil lodged in fibers. Change water for each soak period.

3) Use a mild detergent, disinfectant and lukewarm water. Immerse blanket and work suds in gently, using as little agitation as possible. If necessary, change water and repeat.

4) Rinse in several changes of lukewarm water.

5) Gently squeeze out water. Hang blanket over two lines to dry so it forms an "M" shape or dry it in preheated dryer with several large dry bath towels. Remove blanket from dryer while it is still damp and hang over two lines to finish drying. Gently stretch blanket into shape.

6) Brush blanket on both sides to raise nap. Steam press binding, using synthetic setting on iron. Wash lightweight quilts following directions for wool blankets. Dry outdoors in sunlight, if possible, to remove unpleasant odors.

You may need to take thick comforters apart, and wash cover and filling separately.

Electric blankets

Follow manufacturer's directions, if available. Most manufactures recommend electric blankets be washed, not dry cleaned. Cover plug with heavy cloth, and follow instructions above. Avoid bending the wiring. Do not put electric blankets through a wringer or dry in a dryer, unless manufacturer recommends. To dry, squeeze down blanket lengthwise, and hang over two lines.

Sheets, towels, linens

1) Brush off as much loose dirt as possible.

2) Rinse mud-stained fabrics in cold water to take out particles of soil lodged in fibers.

3) Wash in warm suds and disinfectant several times if necessary. Do not use hot water, since it will set red and yellow clay stains.

4) If stains remain after several washings, try bleaching white cottons and linens with chlorine or sodium perborate bleach. Do not overbleach. Sun drying will aid bleaching. Bleaches may be used on some colored fabrics; follow directions on bleach package.

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PROTECTING VALUABLE PAPERS

Many of us assume that flood, storm or other disasters will always happen to someone else. Or, we may dislike thoughts about death or disaster and consequently postpone the tasks of taking care of important family papers. Protecting family papers is just one part of an estate plan.

An estate plan may include wills, insurance policies, and other items which a family needs to protect its members. *Along with the wills of parents*, a simple estate plan includes a *list of valuable family papers, where these papers are located, the naming of an executor, and those contingency provisions to cover planned and unplanned changes*. A well thought out estate plan also includes distribution of important papers, both originals and copies, to the right places and persons who can provide the best protection for them.

The following checklist is provided to suggest some convenient and effective methods for keeping family papers safe but available when they are needed most — following a death or natural disaster. Valuable papers to keep in your safe deposit box may include:

1) Stocks and bonds
2) Property records, deeds, titles and/or leases
3) Household inventory
4) Contracts (including promissory notes)
5) A copy of your will, (his and hers)
6) Auto title
7) Birth certificates
8) Marriage records
9) Social security cards
10) Important receipts and bills of sale
11) Military service records
12) Adoption papers
13) Passports
14) Citizenship papers
15) Income tax return and supporting documents for years of large transactions and unusual losses or deductions
16) *One copy of a list of all valuable papers*

When making the inventory, don't overlook tools stored in the garage, lawn furniture, or food in the freezer. You may want to include photographs of your inventory. This list should help you determine if you have enough insurance to cover the contents of your home. Keep the inventory current.

Keep these valuable papers in a safe place at home:

1) Warrantees
2) Records of debts and payment schedules
3) Insurance policies
4) Copies of birth and marriage certificates
5) Income tax returns — This will vary from family to family but in general keep:
   a) Copies of tax returns indefinitely
   b) Copies of cancelled checks and receipts for seven to 10 years before discarding.
6) *One copy of list of valuable papers*

Additional copies of valuable papers list should be in the care of a lawyer, the executor of wills, business associates, or trusted family member residing outside your home. The need for greater care of valuable papers increases as your estate size and family size increase; and family goals and life patterns become more complex.

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DRYING BOOKS AND FAMILY PAPERS

Dry books and papers slowly:

1) If books and papers are damp, sprinkle cornstarch or talcum powder between the pages to absorb moisture. Leave powder for several hours and then brush it off.

2) Books that have sustained water damage should be placed on end with pages separated.

3) When pages are partially dry, pile and press books to keep pages from crumpling.

4) Alternate drying and pressing until books are thoroughly dry. This helps prevent mildew. Use a fan to hasten drying.

5) When books are nearly dry, apply low heat with an electric iron. Separate the pages to prevent musty odors. This is a tedious process which you may want to use only with valuable books.

6) Some chemicals such as parachlorobenzene may helps stop mold growth. Books can be placed in closed containers with moth crystals to help stop mold growth. Contact your County Extension office for recommendations.

7) When books are thoroughly dry, close them and use C-clamps to help retain their shape.

8) Books and papers may be frozen until you have time to work with them.

Even if books and papers appear to have dried successfully, they may disintegrate because of materials in the flood water. As a precautionary measure, photocopy important documents or papers.

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CLEANING FLOOD-SOILED CLOTHING

Clean textile items as soon as possible to prevent further staining. Do not immerse flood-soiled clothing in hot water. If floodwaters carried red or yellow clay, hot water may set rust-colored stains. The following procedures are recommended for cleaning flood-soaked garments:

Washable clothing (non-woolen)

1) Line dry articles thoroughly before treating.

2) Brush off loose dirt.

3) Rinse several times in cool water to remove as much mud as possible.

4) Work a heavy duty liquid detergent or heavy concentration of detergent into stain. Let stand 15-30 minutes.

5) When no more dirt can be rinsed out, machine wash using warm water and detergent.

6) Sanitize. Flood water may be contaminated with sewage wastes. Bacteria from floodwaters can remain alive on fabrics for a long time. Four types of disinfectants will kill bacteria. Use whichever is appropriate for the particular fabric:

Disinfectants

1) Quaternary compounds (Roccal, Zephrin) are safe for all fibers, will not damage wool or silk, but may cause some color change. Add these disinfectants at the beginning of the rinse cycle. For top-loading automatics, add 4 tablespoons Roccal or 2 tablespoons Zephrin. For frontloading automatics add 2 tablespoons Roccal or 1 tablespoon Zephrin. Quaternary compounds are available in drug stores and dairy or janitorial supply houses.

2) Liquid chlorine bleaches (Clorox, Purex) are safe for all fibers except wool, silk, or resin-coated (waterproofed or water repellent) fabrics. Add bleach to water before putting the clothes into the machine or dilute bleach in 1 quart water before adding it to the wash cycle. Do not use bleach in the rinse cycle. Use 1 cup in top-loading automatics and ½ cup in front-loading automatics. Chlorine bleaches are available in grocery stores.

3) Pine oil disinfectants (Fyne Pine, King Pine, Pine-o-Pine, Texize-o-Pine) are safe for washable clothing. Do not use them on wool or silk, because the pine odor will linger in these fabrics. Check the label to be sure the product contains at least 80% pine oil. Add pine oil at the beginning of the wash cycle, preferably before putting the clothes in the machine. Otherwise, dilute it in one quart water before adding it to the machine. Use ¾ cup in top-loading automatics, and ½ cup in front-loading automatics. Pine oil disinfectants are available in grocery and drug stores.

4) Phenolic disinfectant (Pine-Sol, Al Pine, Sea-Air) are safe for washables. Avoid using them on wool and silk, because odor will remain. Use 1 cup in top-loading automatics, and ½ cup + 2 tablespoons in front-loading automatics. Add disinfectants either in the wash or rinse cycle. Phenolic disinfectants are available in grocery stores.

Some clothing may have developed mildew stains from prolonged dampness. If stains remain after washing with detergent and water, apply lemon juice and salt or a bleach solution (1 tablespoon bleach to a pint of lukewarm water). Spot-test colored garments before bleaching them.

Washable clothing (woolen)

1) Line dry articles thoroughly before treating.

2) Shake and brush garments well to remove loose dirt.

3) Soak in lukewarm water to remove soil held in fibers.

4) Wash garment in thick suds using a mild soap or a detergent recommended for fine fabrics. Use a disinfectant recommended for wool (see above). Do not use liquid chlorine bleach on wool.

5) Work suds gently into garment using as little agitation as possible.

6) If necessary, wash again in lukewarm suds.

7) Rinse carefully several times in lukewarm water.

8) Dry woolens in a warm place, but not in direct sunlight or near heat. Do not allow woolen garments to freeze. Spread sweaters and other knit garments on tables and shape to desired dimensions.

9) While garment is still damp, press with a medium-hot iron, or allow garment to dry and press on the wrong side with a steam iron. If you must press on right side of the fabric, protect the surface with a pressing cloth. Leave wool slightly damp but do not hang until items are dry. Woolen items may stretch out of shape.

Dry-cleanable clothing

Take any flood-soiled garments ordinarily commercially cleaned to the dry cleaners. Before taking them to the cleaners:

1) Allow garments to dry slowly at room temperature. Do not hang garments near a warm stove or radiator. Be sure garment is dry before you take it to the cleaners.

2) Shake and brush well to remove as much dirt as possible.

3) Tell the cleaner the cause of stains, and the fiber content of the garment if possible.

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REMOVING MUD STAINS FROM WHITE FABRICS

Do not immerse any mud-stained fabrics (especially white fabrics) in hot sudsy water when trying to remove flood stains. If the floodwaters carried red or yellow clay, hot soapy water will set rust-like stains in the fabrics. To safely clean such fabrics:

1) Line dry articles thoroughly before treating.

2) Brush off all possible loose or caked dirt.

3) Rinse several times in cold water.

4) Wash in warm water and detergent. Do not use hot water.

5) Bleach if necessary. The safest bleach is sodium perborate, available in drug and grocery stores. Though not as effective as chlorine bleach, it is safe for all types of fabric, even silk or wool.

For large stains, soak the fabric for at least one-half hour in a solution of 4 tablespoons sodium perborate to a pint of warm water and detergent. Or dip the fabric quickly in a mixture of 1 teaspoon sodium perborate and 1 pint hydrogen peroxide. Rinse in water. Use the bleach mixture immediately after mixing, as it quickly loses strength.

Drying white fabrics in the sun will aid bleaching. Use a nylon whitener or commercial rust remover if necessary.

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CLEANING FLOOD-SOILED LEATHER ARTICLES

Leather articles

Clean

a) To remove surface dirt, rinse with cold water and wipe with a dry cloth.
b) To remove mildew, wipe with a cloth wrung out in dilute alcohol (1 cup denatured alcohol and 1 cup water). Dry in a current of air. If necessary, wash with thick suds of a mild neutral soap or saddle soap. Wipe with a damp cloth.

Dry

a) Stuff purses and shoes with crushed paper to help them keep their shape.
b) Leave suitcases open.
c) Dry all leather at room temperature away from heat and sun.

Condition

a) When leather is dry, rub with saddle soap or Neat's-foot oil. Neat's-foot oil will soften leather, but will also darken it.
b) Unless leather is to be refinished by a commercial cleaner, use a paste-type neutral floor wax for a final polish.

Suede Articles

Use steel wool or a suede brush on suede. Rinse leather or suede jackets or other garments in cold water. Dry away from heat.

Shoes

Remove mud before it dries on shoes. Mud may stain leather, and the longer it stays on, the worse the stain may be. To clean shoes:
a) Scrape off moist mud as soon as possible.
b) Wipe leather with a soft, damp cloth.
c) Stuff shoes with soft, crumpled paper to help them hold their shape, and to absorb moisture on the inside. Shoe trees may stretch the leather out of shape.
d) Dry shoes at room temperature. Too much heat will ruin leather. An electric fan will help the drying process.
e) As shoes dry, clean with saddle soap.
f) When shoes are thoroughly dry, apply a good paste or cream polish.
g) Don't wear shoes until they are thoroughly dry. Wet leather is soft, weak, pulls out of shape easily, tears, cuts, and wears out quickly.

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CLEANING FLOOD-SOILED RUGS AND CARPETS

It is likely that rugs and carpets will have to be cleaned by a professional rug cleaner. However, you can try the following cleaning methods.

Dry

Dry rugs and carpets as soon as possible to prevent mildew. Mildew is a spreading gray-white mold that stains and rots fabrics.

Pull up waterlogged rugs immediately to prevent further damage to the floor. If possible, dry small rugs outdoors in sunlight. Dry blankets or towels can be used to blot up excess moisture.

To get air and heat to carpets, open windows if weather permits, or use household electric fans, crop drying fans, or electric lights suspended in coat hanger "nests." Do not try to vacuum, sweep or shampoo carpets until they are thoroughly dry.

Sweep or Vacuum

After carpet is dry, thoroughly vacuum or sweep to get rid of dirt and debris. Move the vacuum cleaner slowly to pick up more dirt. Clean off as much crusted dirt and sediment as possible before shampooing.

Shampoo (Some rugs may shrink when shampooed.)

1) Use a commercial rug shampoo or make your own shampoo by mixing ¼ cup mild dry detergent and 1 cup warm water in a pail. Beat the mixture with an egg beater until it forms a stiff foam that looks like whipped cream.

2) With a sponge, rub suds on a small patch of carpet (about 2 feet square) with a light circular motion. *Use only the foam.* (If foam disappeares during the shampooing process, beat the mixture again.) Work suds in with sponge. Use a stiff bristle brush if carpet is deeply soiled.

3) Dip sponge in a weak chlorine solution (¼ teaspoon clorox to 1 cup water). Wring out sponge and wipe suds off carpet.

4) Rinse several times with clear water, wringing most of the water from the sponge each time. Change the rinse water as it becomes dirty. Use as little water as possible on the sponge, since water will weaken carpet backing.

5) Blot up remaining moisture with bath towels or other soft absorbent material.

6) Apply lather to another small area, overlapping the first. (Overlapping helps prevent streaking when the carpet dries). Rinse and blot dry. Continue until the entire surface has been cleaned.

Dry

After shampooing, dry rugs or carpets quickly. Hang rugs on line if possible, or lay them out flat in a warm dry place. An electric fan will speed up drying. *Carpets and rugs should be throughly dried.*

Even though the surface seems dry, any moisture remaining at the base of fiber tufts will cause mildew or rot. If you must walk on the carpet before it is dry, put down brown paper. Vacuum again when dry, and brush the nap in one direction.

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DECIDING WHICH FURNITURE TO SALVAGE

Before starting to salvage damaged furniture, decide which pieces are worth restoring. Such decisions should be based on:

a) Extent of damage
b) Cost of the article
c) Sentimental value
d) Cost of restoration

Consider each piece individually.

Antiques are probably worth the time, effort, and expense of restoration. Unless damage is severe, you can probably clean, reglue, and refinish antiques at home. Extensive repair or re-veneering work should be done at a reliable furniture repair shop.

Solid wood furniture can usually be restored, unless damage is severe. You will probably need to clean, dry, and reglue it (see fact sheet, *Salvaging Flooded Wooden Furniture).* Slightly warped boards may be removed and straightened (see fact sheet, *Straightening Warped Furniture Boards).*

Wood veneered furniture is usually not worth the cost and effort of repair, unless it is very valuable monetarily or sentimentally. If veneer is loose in just a few places, you may be able to repair it (see fact sheet, *Salvaging Flooded Wooden Furniture).*

Upholstered furniture may be salvageable, depending on its general condition. Flooded pieces will need to be cleaned and dried, and mildew should be removed. If damage is extensive, you may have to replace padding and upholstery. Since this is an expensive process, it might be wiser to apply the money toward a new piece of furniture.

You will not need to repair all pieces immediately. Any furniture worthy of repair should be completely cleaned, dried, and stored in a dry, warm, well-ventilated place until you have time to repair it.

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STRAIGHTENING WARPED FURNITURE BOARDS

Slightly warped furniture boards, as in table or dresser tops, usually can be straightened if they are made of solid wood.

However, do not attempt to straighten severely warped parts, veneered parts (veneer usually separates), or parts with an elaborate grain, such as curly maple. If such pieces are worth salvage expense, send them to a reliable furniture repair shop. Get a cost estimate before leaving the piece for repair.

To straighten slightly warped boards:

1) Remove the warped board from the furniture.

2) Strip the board of its old finish. A clean board will straighten better than a finished board. You may have to strip the entire piece of furniture to attain an even finish when the board is straightened, refinished, and replaced.

3) The principle of warp removal is to add moisture to the dry side (concave) and remove it from the wet side (convex). You can do this by:
a) placing the board with the wet side (convex) down on a radiator or heat vent in the winter or
b) placing the wet side (convex) up in the direct rays of the sun.
With either method keep the concave side moist with damp cloths and place bricks or other weights on top of the board and leave it for several days or until board is straight.

4) Clamp board in a flat position when it has straightened. Place clamps no more than 12 inches apart. Use small pieces of wood or pads between board and clamps to protect the board. Loosen clamps and move them slightly once or twice a day to prevent splitting.

You may place several boards in the same clamps. Insert small wooden blocks between boards for air space.

5) Stand on end and leave in the clamped position until thoroughly dry. This will take from several days to several weeks.

6) Paint or refinish as desired. Apply the finish to both underside and top of board. This will keep the board from absorbing moisture and from eventually rewarping.

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SALVAGING FLOODED WOODEN FURNITURE

Wooden furniture damaged by floods can best be salvaged through slow drying and proper repair.

Submerged furniture

1) Take furniture outdoors and remove as many drawers, slides, and removable parts as possible. Drawers and doors will probably be stuck tight. Do not try to force them out from the front. After allowing to dry for a brief period, use a screwdriver or chisel to remove the back and push out the drawer from behind.

2) After you have removed movable parts, clean off mud and dirt, using a hose if necessary.

3) Take all furniture indoors and store it where it will dry slowly. Furniture left in the sunlight to dry will warp and twist out of shape.

4) When furniture is dry, reglue it if necessary. You will need wood working tools and clamps to reglue some pieces. Before you start, decide whether you have the time, equipment and ability to do the work. Consult an experienced cabinet maker if necessary. To reglue loose joints, thoroughly clean joints of old glue so the area will be as clean and free of glue as possible. Use a white all-purpose glue, following directions on container. Hold parts together with rope tourniquets or suitable clamps. To prevent damage from ropes or clamps, pad contact areas with cloth protection.

Damp furniture — removing white spots

Furniture that has been submerged in flood waters will frequently exhibit mildew or mold which can be removed with warm soapy (mild detergent) water and a soft cloth. White spots or a cloudy film may develop on damp furniture that has not been submerged. To remove white spots:

1) If the entire surface is affected, rub with a damp cloth dipped in turpentine or camphorated oil, or in a solution of ½ cup household ammonia and ½ cup water. Wipe dry at once and polish with wax or furniture polish.

2) If color is not restored, dip 3/0 steel wool in oil (boiled linseed, olive, mineral or lemon). Rub lightly with the wood grain. Wipe with a soft cloth, and rewax.

3) For deep spots use a drop or two of ammonia on a damp cloth. Rub at once with a dry cloth. Polish. Rubbing cigarette ashes, powdered pumice, or a piece of walnut into spots may also help remove them.

4) If spots remain after all efforts to remove them, the piece should be stripped of the old finish and refinished.

Veneered furniture

Thoroughly dry furniture. If veneer is loose in just a few places, carefully scrape glue under loose areas.

1) Press veneer back in place. Place wax paper over affected area and heat with warm iron, remove iron and place weights on area.

2) If veneering doesn't stay in place or is bubbled, carefully slit the loose veneer with a razor blade, apply a good quality glue. Weights are applied after covering glued spots with wax paper to prevent excess glue (which may spurt out when pressure is applied) from gluing the weights to the furniture.

Repairing badly damaged veneered furniture requires special skill and tools. Unless you are an experienced woodworker, don't attempt the job yourself. Take the furniture to a cabinetmaker, or have your dealer return it to the factory for repair.

If insurance allows part value on flood-damaged furniture, it may be financially worthwhile to apply the money to new articles, rather than pay for extensive repairs.

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SALVAGING FLOODED UPHOLSTERED FURNITURE

Upholstered furniture that has been submerged in flood water may be impossible to salvage if it has been badly soaked. If the piece seems worth the effort, however, you will need to clean and oil the springs, replace stuffing, and clean the frame.

Stuffing and covering

1) Remove furniture coverings using a ripping tool, hammer, or tack puller, screwdriver, or chisel.

2) Remove all tacks from the frame.

3) Wash coverings (see fact sheet, *Cleaning Flood-Soiled Rugs and Carpets).*

4) Throw away all cotton stuffing. You can dry, fumigate, and reuse padding made of materials other than cotton.

Springs and frame

1) Wipe off springs and frame. Dry all metal parts and paint them with rust inhibiting paint. Oil springs.

2) Store wood frames where they will dry out slowly.

Mildew

Mildew may have developed on damp or wet furniture. Mildew is a gray-white mold that leaves stains and rots fabric unless it is removed promptly. To remove mildew or mildew spots:

1) Brush with a broom to remove loose mold from outer covering. Do this outdoors if possible, so you won't scatter midew spores (which can start new growth) in the house.

2) Vacuum the surface to draw out mold. Dispose of the vacuum cleaner bag outside to avoid scattering mold spores in the house.

3) If mildew remains and fabric is washable, sponge lightly with thick soap or detergent suds. Wipe with a clean, damp cloth. Get as little water on the fabric as possible, so the padding doesn't get wet.

4) If mold remains, wipe the furniture with a damp cloth dipped in dilute alcohol (1 cup denatured alcohol to 1 cup water) or a chlorine bleach solution (¼ teaspoon bleach to a cup of water).

5) Dry the article thoroughly.

6) Use a low-pressure spray containing a fungicide to get rid of musty odors and remaining mildew. Moisten all surfaces thoroughly. Respray frequently if mildew is a continuing problem. Spraying rooms with an aerosol material will not eliminate mildew problems.

7) If molds have grown into inner part, send furniture to a dry cleaning or storage company for thorough drying and fumigation. Fumigation will kill molds present at the time, but will not protect against future attacks.

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DAMAGED SHADE, ORNAMENTAL, AND FRUIT TREES

The care you give damaged trees should depend on their age, the extent and type of damage, and the time required for surrounding soil to reach normal moisture levels.

A tree's age largely determines its ability to recover. A young, vigorous tree is more likely to survive than an older one, though sometimes an older tree's deep roots help it withstand the force of a flood. Usually, a damaged older tree will be weakened more than a young tree receiving the same damage.

Damages include fallen trees, broken and torn limbs, wounds, split branches, uprooting, weakening, and exposed roots.

Fallen trees

Plan ahead before deciding what to do with fallen trees. In general, it is best to reset only smaller trees, since large trees will be weakened and may fall again, perhaps damaging property.

Decide what to do with tree stumps. If you are going to leave them, cut off flush with the ground. If you have them removed, leave 4 feet of stump standing. Removal will be cheaper and easier if stumps can be pulled out rather than dug out.

Broken and torn limbs

This damage will affect the shape as well as the general health of the tree. Prune the tree properly to avoid additional damage:

1) Cut off broken or torn limbs to avoid unnecessary bark stripping. Leave a smooth finish flush with the trunk or branch from which you prune; never leave a stub.

2) Recent research suggests that tree wounds may be left unpainted. There appears to be little, if any, benefit from coating the cut surface. Any coating used is more cosmetic than useful:

To remove large heavy limbs, use three cuts to avoid ripping bark and wood.
a) Make a cut on the underside of the limb, about 1 foot from the trunk or branch from which you are pruning. Cut only about one-third through the limb.
b) Make a second cut on the upper side of the limb, about 2 to 6 inches farther out on the limb than the first cut. Continue sawing until the branch splits off.
c) Remove the remaining stub by making a single cut flush with the trunk or branch from which you are pruning.

Wounds

The amount of damage to the bark of larger shrubs and trees affects the plant's ability to recover, especially when there is more than one type of injury.

1) Remove all jagged and protruding wood. Make smooth, clean cuts with a saw or chisel.

2) If the wounds are bark wounds, remove loose bark. To remove bark, make smooth, clean cuts to form a boatshaped area pointed at both ends.

3) No painting of the exposed area is necessary.

Split branches

If branches are split at the crotches, pull them back into place and secure them with lag-threaded screw rods:

1) Bore a hole through the trunk or branch at the place above the split where the screw rod is to be inserted. Make the hole 1/16 inch smaller in diameter than the diameter of the screw rod.

2) Insert the screw rod until the point is nearly to the opposite side.

3) Cut off the protruding end.

4) If the split is long, insert as many screw rods as necessary, 12 to 18 inches apart. (Or use regular bolts with washers on each end. Countersink the bolt so that the washers will rest on the hard wood.)

5) Any type of repair to split parts will be temporary since this form of injury is slow to heal and may not heal well in any case.

When straightened, these trees will require bracing for a long time. With few exceptions larger trees and shrubs will always be weakened.

Before you reset a tree, cut and smooth all jagged and irregular root breaks. After resetting, water the tree well and keep it watered during dry periods. Do not remove guy wires or braces for at least 2 years.

Prune a damaged tree just enough to balance root losses. Cut out broken, diseased, and malformed branches to give the tree a desirable shape.

Weakened trees

If the crown of the tree needs strengthening, use cables between the weakened branches:

1) Insert lag bolts from one-half to one-third of the way between the base and tip of the branches you want to brace.

2) Attach the ends of the cable to the bolts and tighten the nuts to draw the cable taut. A block and tackle will make the job easier.

3) Avoid using short lengths of cable low on the tree.

Exposed roots

Exposed roots should be covered. Use nearby sand and silt deposits if there are any. It is not essential to use regular soil to cover roots. Build the root cover to its approximate level before the flood. Do not build it higher.

Continued care

After repairing trees, continue to care for them:

1) Remove silt and sand deposits. To prevent further damage to root systems, remove all deposits to the level of the soil before the flood.

2) Check soil moisture. The variety and species of trees and the soil's natural ability to retain or expel excess moisture will determine what actions are necessary to avoid losses due to excess moisture.

3) Mulch. Mulching is safer than fertilizing for damaged trees.

4) Prune a damaged tree just enough to balance the loss of roots. Cut out broken, diseased and malformed branches and give the tree a desirable shape.

Evergreens

Take care of evergreen injuries promptly. A water soluble wax, available commercially, helps cut down on water loss through leaf surfaces. This material is called antitransparent.

For further reference

Trees will grow stronger, and be more wind resistant if you plant large trees at least 50 feet apart; small trees should be planted at least 40 feet apart. Place them at safe distances from buildings and electric wires.

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SALVAGING FLOOD-DAMAGED SHRUBS AND ORNAMENTALS

Standing water

Dormant trees, shrubs, or perennials will tolerate standing water for several days without sustained injury. When they are growing, however, plants can "drown" from standing water.

Silting

The greatest threat to ornamentals during spring flooding is silting.

Silting occurs when soil carried by rapidly moving water is dumped into sluggish streams, where it is deposited on flooded land adjacent to waterways. Silt deposits may vary in depths up to several inches.

Trees and shrubs are usually not harmed by silt deposits. Iris, peonies and chrysanthemums could be damaged or killed. Silt damage results in crown and root disorders on these plants. The degree of injury depends on how long water remains, and the depth of silt deposited.

To reduce silt injury to plants:

1) Wash the silt from crowns of plants with a garden hose. If the plants are on well-drained soil, you can wash the silt away from the plants. On evergreens, a mild detergent will aid in removing silt.

2) Wait until the silt dries. Then rake the excess soil away from the plants. A small amount of silt is not harmful to grass, and can be raked into the grass.

Erosion

If much soil has eroded, replace it with good topsoil around the base of plants. Depth should equal original soil depth. Mulch newly applied topsoil to prevent runoff. Fertilize as recommended.

Soil deposits

If excess soil has been deposited around the base of plants causing a change in grade, remove excess soil so that the level is as close to the original grade as possible.

grasses may be made anytime during the growing season. Seedlings, especially of cool season grasses, should be made in early spring (March or April) or late summer (August or September).

Flooded lawns

Degree of injury will depend on duration of submergence, water depth, temperature, grass species, light intensity and the condition of grass prior to flooding.

Grass will survive much longer at water temperatures below 60°F than at higher water temperatures.

Centipedegrass, red fescue and ryegrass have poor tolerance to submergence. Bermuda grass, bentgrass, buffalograss, and zoysia have excellent tolerance to submergence. Kentucky bluegrass, tall fescue, crested wheatgrass and rough bluegrass are intermediate in tolerance.

Most grasses will survive 4 to 6 days submergence at normal summer temperatures. Aerate and lightly fertilize flooded areas as soon as possible after the water recedes. Areas submerged longer than 4 to 6 days may not survive and will require complete re-establishment as noted above.

Loss of topsoil — eroded areas

1) Where topsoil has been greatly eroded, replace it to a depth of 4 to 6 inches late in the growing season.

2) If topsoil is unavailable or too expensive, improve existing soil by adding organic matter such as peat, manure, or other materials. Sand may be needed for clay soils. Apply these materials at the rate of 3 cubic yards per 1000 square feet of lawn area, and work materials into the top 4 inches of subsoil. A temporary lawn, established immediately and later worked into the subsoil, can also be a source of organic matter.

Establishing temporary lawns

1) Where lawns must be completely re-established and immediate cover is needed, scratch the soil surface with a hand rake or similar tillage tool.

2) Seed common ryegrass at a rate of 4 to 5 pounds per 1000 square feet.

3) Till the ryegrass under at the appropriate time for reestablishment. Seed permanent grasses, or plant vegetative material.

Oil and chemical spills

Soils may have been saturated with oil, herbicides, or other toxic material. Petroleum will eventually decompose, but nothing can be done in the meantime to cancel its harmful effects. On large areas, bury oil deposits by deep plowing. On small areas, remove petroleum-soaked soil to a depth of 6 inches, and replace with new topsoil. Reseed or vegetatively plant at the appropriate time.

Turf diseases

Turf diseases may be prevalent on surviving turf areas. Contact your county Extension agent for advice on fungicide application.

Weeds

Flood water may carry and spread weed seeds. However, weed control should not be a primary concern, since a weed cover is better than no cover, and will even help dry out soil. Weeds can be controlled best with chemicals in the fall or spring. Contact your county Extension agent for proper chemical controls.

Ask your county Extension agent for information for establishing and maintaining lawns.

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TIPS FOR HANDLING FLOODED SOILS

1) Open all drainage ditches.

2) Remove debris from fields and pastures. Look carefully for partially hidden objects that could injure livestock or damage machinery. Check hedge and fence rows carefully.

3) To prevent severe soil compacting, avoid running trucks and heavy farm equipment over wet soils. Most soils are not dry enough for traffic or cultivation until the top 5 or 6 inches crumble rather than slick over or pack.

4) Encourage the growth of cover crops. Any type of plant growth is effective in drying waterlogged soils.

5) It is usually not necessary to remove silt deposits. After soils are dry enough to work, level and incorporate silt deposits into original topsoil, if practical.

6) Apply animal manure and incorporate into soil. Check with county Extension agent for recommended application rates.

7) The fertility level of flooded soils will probably change over a period of time. Do not guess at requirements. Take soil samples to determine new fertility levels. Follow recommendations. Allow for nutrients supplied by applied animal manures. When sampling silted fields, make sure the samples represent the soil mix that will exist after deposited silt is mixed with the original topsoil.

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CARING FOR FLOODED LAWNS

Debris

Pick up any debris, such as wood, glass, stones, nails and other metal objects deposited on lawn areas. This debris is a safety hazard to operators, and can damage power mowers. Remove leaves or any other material which smothers grass.

Silted Lawns — 1 inch or less

Lawns submerged for less than 4 days and covered with an inch or less of silt have a good change of recovery.

To assist recovery:

1) If water use is unrestricted in your area, wash as much silt as possible from the lawn using a garden hose.

2) To encourage root development, keep the remaining silt crust broken throughout the growing season, or until grass has become well established. Use a steel tooth graden rake. Caution: Steel tooth rakes can pull out the turf if pushed too deep to break a crust which might exist. A mechanical hollow-tined aerator, can be used to break up the silt crust.

3) Apply a nitrogen fertilizer to the lawn. Use whatever grade fertilizer you can obtain, applied at a rate of 1 pound nitrogen per 1,000 square feet of lawn area.

4) Have a soil sample tested as soon as possible to determine lime, phosphorous and potassium requirments of soil. Follow the recommendations given with soil test report.

5) If lawn recovery is spotty or generally thin, mechanically aerate the lawn four to six times in late summer or early spring. Then overseed with a desirable grass seed.

In southern areas, vegetative sprigging or plugging may be preferable to seeding.

Silted lawns —more than 1 inch

Lawns covered with more than 1 inch of silt may be heavily damaged, with only a slight chance of recovery. Degree of recovery will vary with grass species and depth of silt. Reestablish the lawn as follows:

1) Remove as much silt as possible, especially if silt accumulation exceeds 3 inches.

2) If silt is less than 3 inches, or has been removed to this depth, till the area, making sure the silt is mixed thoroughly and uniformly through the top 4 to 6 inches of original soil.

3) Test the soil for contaminants. Contact your state department of agriculture for recommendations and list of independent laboratories capable of pesticide residue analyses.

4) Many lawns have been encountered where it would be beneficial to have the silt incorporated into the soil. Many athletic fields, especially football and soccer fields, could use the silt.

5) Reseed or vegetatively replant the area as you would to establish a new lawn. Vegetative plantings of warm season