

Flood Recovery Booklet

ICPC

**Iowa Conservation and Preservation
Consortium**

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Revised and Expanded

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The information and general recommendations provided in this publication are intended only as practical guidance in the recovery of water-damaged materials and structures. The publishers assume no liability for damage or unsatisfactory results in the treatment of objects or structures utilizing these recommendations.

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Preface

This booklet was made possible with the support and assistance received from many institutions, among them:

[American Institute for Conservation of Historic and Artistic Works \(Washington, D.C.\)](#)

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Introduction

Whether you or your home have been greatly affected by flood or slightly, this booklet is intended to aid your flood recovery efforts. It contains information and helpful tips on safety, cleaning your home, cleaning and stabilizing important family documents and memorabilia, and where and how to find additional assistance.

Read through this booklet before beginning your recovery efforts. Then list and prioritize the tasks ahead of you. What those priorities are depends on where you're starting from, whether your home needs to be cleaned and inspected before it is once again safe for occupancy, whether you have a few wet pieces of furniture or several, whether you have just a few wet documents and heirlooms or many.

The first section of this booklet, titled [Home and Safety](#), can help you plan your priorities. Knowing your priorities before you begin will help your recovery efforts progress smoothly. [Nine Steps to Recovery](#) provides step-by-step information on making your home livable again. The [Do's and Don'ts](#) and [Disaster Supplies](#) pages give you information on what procedures and materials you will need for your specific recovery.

[Treating Damaged Materials](#), the second section, provides information that can help you stabilize important family papers, books and heirlooms. This section contains important technical information on how to best treat water-damaged items.

The third section, [Where to Go for Help](#), will provide you with a list of various [hotlines](#) and information ranging from local [conservators](#) to helpful [disaster recovery](#) agencies and organizations.

Don't lose hope, much can be done to stabilize and even restore your unique family items. This booklet provides you with the information you need to begin your recovery efforts.

GOOD LUCK!

Flood Safety Tips

After a flood has swept through your community, keep yourself and your family safe by following these important safety tips:

Do not walk through flowing water

Drowning is the number one cause of flood deaths. Most of these drownings occur during flash floods. Six inches of moving water can knock you off your feet. Use a pole or stick to make sure that the ground is still there before you go through an area where the water is not flowing.

Do not drive through a flooded area

More people drown in their cars than anywhere else. Don't drive around road barriers; the road or bridge may be washed out.

Stay away from power lines and electrical wires

Electrocution is also a major killer in floods. Electrical current can travel through water. Report downed power lines to your utility company or local emergency manager.

Turn off your electricity when you return home

Some appliances, such as television sets, can shock you even after they have been unplugged. Don't use appliances or motors that have gotten wet unless they have been taken apart, cleaned and dried.

Watch for animals, especially snakes

Small animals that have been flooded out of their homes may seek shelter in yours. Use a pole or stick to poke and turn items over and scare away small animals.

Look before you step

After a flood, the ground and floors are covered with debris including broken bottles and nails. Floors and stairs that have been covered with mud can be very slippery.

Be alert for gas leaks

Use a flashlight to inspect for damages. Don't smoke or use candles, lanterns or open flames unless you are sure that the gas has been turned off and the area has been aired out.

Carbon monoxide exhaust kills

Use a generator or other gasoline-powered machine outdoors. The same goes for camping stoves. Fumes from charcoal are especially deadly--cook with charcoal only outdoors.

Clean everything that got wet

Floodwaters pick up sewage and chemicals from roads, farms, factories and storage buildings. Spoiled food, flooded cosmetics and medicines are health hazards. When in doubt, throw them out.

Take good care of yourself

Recovering from a flood is a big job. It is tough on both the body and the spirit. A disaster may have long-lasting effects on you and your family. Rest often and take good care of yourself and your family

"Flood Safety Tips" is from: Repairing Your Flooded Home, a joint publication of [FEMA](#) (Federal Emergency Management Agency, an independent federal agency) and the [American Red Cross](#). Copies of this booklet are available at no charge, from FEMA. To request a copy, call FEMA at 1-800-480-2520 (request "FEMA 234--8/1992").

Nine Steps to Recovery

Step 1 Take Care of Yourself First

Care for Yourself

- Keep the family together
- Discuss your problems
- Rest often and eat well
- Set a manageable schedule
- Watch for signs of stress
- Seek help
- Floodproof as you rebuild

Care for Your Children

- Try to keep the family together
- Listen to what children say
- Explain the disaster factually
- Reassure children
- Be understanding
- Take care of yourself

Stay Healthy

- Small children, pregnant women and people with health problems should avoid flooded areas until cleanup is complete
- Wash your hands with soap and water, thoroughly and often
- Confirm that the water is clean and safe
- Disinfect dishes and everything else that floodwaters touched
- Avoid injuries
- Watch out for fatigue
- Be safe around poisons
- Report health hazards
- Be patient

Step 2 Give Your Home First Aid

Make sure it is safe to go back

Check your home before you go in

- Turn off the electricity
- Turn off the gas

Enter carefully

Rescue the most valuable items

Protect your home from further damage

- Get fresh air moving through your home
- Patch holes
- Repair sagging floors or roof sections
- Remove debris
- Check for broken or leaking water pipes

Drain your basement carefully

Hose the house and its contents

Step 3 Get Organized

Call your insurance agent

- Homeowners insurance usually covers losses caused by wind, storms or broken water pipes, but not surface flooding
- Flood insurance covers most losses caused by surface floodwater
- Wind and hail insurance covers losses in coastal areas from the winds of a hurricane

Begin listing the damage

Check for structural damage

Plan your recovery

- Make sure it is safe to work in your home
- Decide what you can and can't do
- Decide if you need financial assistance
- Check with your mortgage holder
- Think before you use credit cards
- Keep talking openly with your family

Step 4 Dry Out Your home

Floodwaters affect a house three ways:

- Water damages materials: wallboard will disintegrate if it stays wet too long; wood can swell, warp or rot; electrical parts can short out, malfunction and cause fires or shock
- Mud, silt and unknown contaminants in the water not only get everything dirty; they are also unhealthy
- Dampness promotes the growth of mildew, a mold or fungus that can grow on everything

Lower the humidity

- Open up your house
- Open closet and cabinet doors
- Use fans
- Run dehumidifiers
- Use desiccants
- Call a contractor

Sort contents

Discard debris

Drain ceilings and walls

Dry ceilings and walls

Dry floors

Step 5 Restore the Utilities

If your furnace, water heater, stove or other gas or oil appliances were flooded to the level of the burners, *turn off the valve on the pipe to the appliance.*

[Flood insurance](#) and [federal disaster assistance programs](#) will often help you replace flooded gas and oil appliances.

If you want to keep a gas or oil appliance, *have it cleaned professionally.*

If you are not experienced and comfortable working on your utilities or appliances, *call a professional.*

Step 6 Clean Up

Every flooded part of your house--walls, floors, closets, shelves, contents--should be thoroughly cleaned and disinfected. Some can be done by you, others should be completed by professionals.

Cleaning supplies checklist

- Brooms, mops, brushes, sponges
- Buckets, hose
- Rubber gloves
- Rags
- Cleaning products
- Disinfectants
- Lubricating oil
- Trash bags
- Hair dryer

The [American Red Cross](#) and other organizations often distribute cleanup kits after a disaster. These contain things like a broom, mop, bucket and cleaning supplies.

Cleaning Tips

- Tackle one room at a time
- Use one bucket for the cleaning solution and another for the rinse water
- Replace the rinse water frequently

Step 7 Check on Financial Assistance

How much you can rebuild and replace depends on what you can afford. Four sources of financial assistance can help you through recovery:

Insurance

- If you have flood insurance, call your insurance agent to file a claim and report the damage as soon as possible after the flood
- An adjuster will be assigned to your home to settle your claim
- While you are waiting for the adjuster, organize the information you will need:
 - Take photos or videotape the damage
 - Separate your damaged and undamaged belongings
 - Find receipts, cancelled checks or proofs of purchase

Government disaster programs

- If the flooding was widespread and caused a lot of damage, your community may be eligible for state or federal aid. Before it can receive this assistance, your community must be declared a disaster area by your governor, a federal agency or the President.
- The following are programs available if the President issues a disaster declaration for your area:
 - Disaster Housing Assistance
 - Disaster Loans
 - Individual and Family Grants
 - Income Tax Deductions
 - Floodproofing Assistance
 - Counseling

Volunteer organizations

- Groups like the [American Red Cross](#), the [Salvation Army](#) and church groups are usually at the disaster site during or immediately after a flood and help with people's immediate needs, such as groceries, new clothing, shelter, medical aid and counseling.

Businesses

- Listen to your local TV and radio for businesses that are contributing to the recovery process.

Step 8 Rebuild and Floodproof

Don't just build it back: build it back better. Floodproof your home by remodeling or rebuilding it using materials and methods that will prevent or minimize damage from future floods.

There are five floodproofing strategies:

- Elevation
- Relocation
- Floodwalls
- Dry floodproofing
- Wet floodproofing

Remember that *local building codes usually require a building permit* before you start to repair or alter your home.

If you need a contractor to help you rebuild, talk to several before signing anything. *A good contractor will agree that you take the following steps:*

- Check the firm's reputation
- Ask for proof of insurance
- Ask for references
- Ask for a written reference
- Ask for a contract
- Ask for any guarantees in writing
- Get a copy of the final signed contract
- Don't sign off before the job is finished

Step 9 Prepare for the Next Flood

Buy flood insurance

Even if you have flood proofed your home, you still need insurance to protect you from unexpected events, such as a flood that rises higher than your flood protection level.

If you have insurance, find out if you have the right kinds of coverage, and if the coverage is adequate.

Remember that homeowners insurance policies do not cover damage from floods, but you can purchase flood insurance under the [National Flood Insurance Program](#) through any licensed insurance company or agent.

Develop a flood response plan

Develop a response plan based on your flood protection level, local warning procedures and the amount of warning time you will have to respond before the flood comes.

Develop a checklist of steps to take before flood waters reach your home:

- Listen to local TV and radio stations for flood information and evacuation routes
- Get into the habit of keeping a full tank of gas in your car
- Pack your car with supplies you will need while away from home
- Put supplies needed for cleanup and recovery in a safe place
- Take your pets to a kennel or a friend's home on high ground
- If you have enough warning time, move the contents of your home above the flood protection level or to another safe place
- Install flood shields and other floodproofing measures you have prepared
- In hurricane-prone areas, protect against wind damage
- Tape plastic around the cap of your well
- Turn off electricity, gas, oil and water
- Follow your designated evacuation route to a place of shelter

Help your community implement a flood protection program

There are many ways to protect your community from floods:

- Flood control projects, such as dams and levees
- Keep ditches and drainage ways open
- Report illegal floodplain construction-- those without a permit
- Sandbagging

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What You Should Know Before You Have to Evacuate

Before a flood forces you to evacuate your home, you should have information and supplies ready to take with you in case your home and belongings are damaged or destroyed.

Here is a checklist of what you should have ready:

- Battery operated radio and extra batteries
- Flashlight and extra batteries
- First aid kit and manual
- Three-day supply of nonperishable foods and water (one gallon per person per day)
- Essential prescription and nonprescription medications
- Mess kit or paper cups and plates and plastic utensils
- Baby supplies such as formula, bottles, diapers, powdered milk and medications
- Nonelectric can opener
- Utility knife
- Toilet paper, towelettes
- Soap, liquid detergent
- Feminine supplies
- Personal hygiene items
- Contact lenses, extra eyeglasses
- Supplies for dentures
- Complete change of clothing and footwear for each person
- Sturdy shoes or work boots
- Rain gear
- Cash or traveler's checks, change
- Whistle
- Entertainment--book and games

It is also important to keep important family documents in a waterproof, portable container you can grab quickly in case of evacuation.

- Insurance policies, wills, contracts, deeds, stocks and bonds
- Passports, social security cards, immunization records
- Bank account numbers
- Credit card account numbers and companies
- Inventory of valuable household goods, important telephone numbers
- Family records (birth, marriage, death certificates)

Remember that you won't have a lot of time during evacuation. Map and practice the drive to the shelter of your choice or evacuation destination. Time the trip and multiple it by three to account for evacuation traffic and road conditions.

United States Department of the Interior

NATIONAL PARK SERVICE

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AFTER THE FLOOD: Emergency Stabilization and Conservation Measures

After the flood waters begin to recede, the focus of relief efforts becomes returning things to normal. During this phase, many historic structures and properties are needlessly lost and damaged through hasty clean-up procedures. The best way to help a historic district, property, or structure prevent additional damage and maintain its integrity and character during these times of duress is with the use of proper caution and concern.

While the water is receding, plan the future steps to rehabilitation and restoration carefully. Each decision made today affects future decisions which will need to be made tomorrow. The following areas of concern should be addressed during planning.

PERSONAL SAFETY: The First Priority

1. Return to the area only after it has been declared safe by local emergency management officials. Follow all emergency rules, laws and regulations.
2. Identify potential hazards and solicit expert advice and assistance to minimize the dangers. Report and stay clear from loose power lines or damaged utilities.
3. Turn off all utilities associated with the historic property to prevent further damage and minimize future hazards.

DOCUMENTATION: Developing a Condition Assessment Report

1. Prepare a visual record showing the scope of the disaster and the damage to the historic fabric. This is best done through annotated photographs, and narrated videotape taken before the cleanup actually begins.
2. Create an inventory of found items, dislodged architectural features, decorative fragments, furnishings, collections, etc. **DO NOT THROW AWAY MATERIALS AT WILL.** Many items may prove their value as the surrounding restoration or rehabilitation projects proceed.
3. Use the gathered information to have a team of preservation professionals develop a prioritized plan of stabilization, repair, and restoration.

STRUCTURAL STABILIZATION: Temporary Measures

1. Identify potential deficiencies and provide temporary shoring to protect life, property, and belongings while the water levels are receding. Successful shoring can be accomplished without increasing the damage to the historic features or materials. All shoring measures should be planned with the assistance of qualified structural engineers or contractors.

- Support unstable or leaning structures or features with temporary bracing and reinforcement.
 - Strengthen exposed foundations or brace areas of undermining by following engineer's recommendations.
 - Brace and strengthen decayed or damaged floor and ceiling structure. Check bearing locations for movement or settlement.
2. Clean and repair the structure's roof and roof drainage system in order to protect the building from future storm damage.
 - Provide temporary protective roof coverings where the existing roof has been damaged.
 - Clean, repair and reconnect gutters and downspouts.
 - Drain contained water slowly and carefully from the interior of the structure to prevent undue stress which may cause structural failure. Make sure the decreasing water level remains equal to the exterior and adjacent conditions.

DRYING OUT: Natural Ventilation and Time

1. Carefully remove trapped mud and collected water/storm debris as water recedes. Do not unnecessarily damage covered historic finishes or materials.
2. Remove standing water and water-logged furnishings and debris that maintain a source of moisture within the structure.
 - Drain the water from the basements and crawl spaces. Standing water will migrate and perpetuate the moisture problems on the upper levels.
 - Furnishing should be moved to allow air movement and ventilation around them.
 - Remove and dry water soaked rugs, boxes, and materials. Paperwork and books may require special care and considerations.
 - Remove water soaked insulation from the attic and if easily accessible without damaging historic fabric and materials, remove insulation from cavity wall construction.
 - Check and drain trapped water from mechanical chases, equipment, and HVAC ductwork.
3. Remove residual moisture in a gradual and controlled process through natural ventilation. Do not use mechanical dehumidification which may cause additional damage.
 - Open windows and doors. Provide protection and security measures as required through the use of screens and vents.
 - Provide moderate ventilation through the use of fans. Heating may be provided when conditions warrant, but do not hurry the process. Natural drying is preferred.
4. Allow plaster to dry gradually, avoiding cracking and separation of layers.

Forced drying through the use of dehumidifiers and heaters may draw excessive moisture through the plaster leading to excessive expansion, cracking, and powdering of the finished surface.

Carefully remove all flood soaked Gypsum Wall Board. It is a porous material which degrades under extreme moisture trapping fungus and bacteria that pose health hazards.

- Remove trapped water from cavity wall construction and interior partitions by carefully removing the baseboard and drilling a drain hole through the plaster and lath near the

bottom of each wall cavity. Do not damage architecturally significant or character defining features.

- Remove non-historic artificial wall covering and paneling which may trap moisture within the wall. Consult a preservation specialist on the treatment of historic wall finishes.
5. Allow wood to air dry gradually. Promote even drying through proper ventilation. In most cases, swelling and warping of the solid wood, flooring and framing, will be minimal and decrease as the wood dries. Laminate wood surfaces may experience separation and warping caused by the uneven drying of the layers.

Forced drying through the use of dehumidifiers and heaters will cause uneven drying, resulting in the cupping, warping, and checking of the wood.

Monitor the wood. If wood elements remain damp after the other moisture problems have subsided, fungus and/or rot and decay may develop.

- Remove sheet vinyl linoleum, or VCT tile to allow for maximum evaporation. Protect and store historic floor finishes that have been removed.
- Protect the wood floors from undue traffic and abuse, until they are dry. Wood becomes soft and easily damaged when it is wet.

HOUSEKEEPING MAINTENANCE Initial Cleaning and Repair

1. Rinse remaining mud, dirt and flood debris from all surfaces with freshwater. Do not use high pressure water on historic materials. Use extreme care and caution around decorative features and damaged elements.
- TURN OFF ALL ELECTRICITY BEFORE CLEANING WITH WATER.
 - Open electrical outlets, mechanical chases, etc. and rinse these areas thoroughly. Check wiring and connections for damage and repair as required. Let areas dry before closing them.
 - Check for loose plaster; and either resecure it in place or carefully record and remove it by hand. Decorative elements which are loose may be carefully recorded, removed, labeled and saved for reinstallation.
 - Supporting loose plaster: Plaster may be temporarily supported through the use of plywood and wooden T braces. Use padding and care to protect all decorative elements from additional damage when using this method.
 - Securing loose plaster: Secure loose plaster and lath to the original framing by using screws and plaster washers. Protect decorative elements from damage by carefully selecting the attachment locations.
 - Decorative wood elements may become loose or detached during flooding. Check for loose, damaged or deteriorating wood. Either resecure loose elements in place or carefully record and remove it by hand, labeling and saving the element for reinstallation.
 - Securing loose wood: secure loose wooden elements to the framing by using or reinstalling original fastenings. Protect decorative elements from additional damage by carefully reusing the attachment locations.

- Use standard non-sudsing household cleaning products as directed by manufacturers instructions to remove remaining dirt and stains. Special care and caution should be used when working on or around historic materials. After cleaning, use a disinfectant to kill the germs, bacteria and smell left by flood waters.
 - Do not use cleaning solutions that will trap or impede moisture movement within the historic materials.

This information was produced and compiled by the Preservation Assistance Division, National Park Service, Washington, DC. (202) 343-9578.

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Creating a Mold Preventive Environment

Reprinted in part from "[The Invasion of the Giant Mold Spore](#)"

[SOLINET Preservation Services](#) Leaflet

By Sandra Nyberg, November 1987

Revised 2003

Mold and mildew can have an adverse effect on people. Those with allergies, asthma or other respiratory problems should stay away from infested areas, as many fungi will seriously irritate and inflame lungs. Some fungi can cause skin and eye irritation and infections. Prolonged exposure to germinating molds in closed areas (which exist in many library collections) can damage the lungs, mucous membrane, cornea, respiratory tract, stomach, intestines, and skin. Some varieties of mold are highly toxic.

People predisposed to upper respiratory problems such as allergies and asthma should not be exposed to areas affected with mold, even if they wear a respirator. For health reasons, even a small mold outbreak should be taken seriously. You should wear disposable rubber or plastic gloves, a lab coat and a respirator whenever handling moldy materials. Ordinary dust masks are not sensitive enough to filter mold spores, use a respirator with a HEPA (high efficiency particulate arrestant) filter. Be aware that respirators are ineffective if used improperly; for example, people with facial hair will not be protected because they can't get a tight fit. Wash protective clothing in hot water and bleach.

What can you do to prevent a mold outbreak?

The **ONLY** way to permanently protect your collections from mold is to control the environment by keeping the temperature within 65°-70° Fahrenheit and the relative humidity within 45%-65%. Prevention is the key but if you do experience a mold outbreak there are non-chemical means for clean-up and recovery. Some chemicals kill mold, but the only safe and effective way to keep it from coming back is to modify the environment which contributed to the development of mold. **Some of the chemicals used in the past by libraries to kill mold are no longer recommended, because many are harmful to both people and collections.**

For patron comfort, temperatures of 70° Fahrenheit plus or minus 2° are acceptable in libraries, provided relative humidity is kept at 50%. In conjunction with humidity and temperature control, adequate air circulation will help prevent mold growth. Air circulation helps control moisture levels through evaporation.

- Don't shelve books directly against an outside wall. Due to temperature and humidity differences between inside and outside environments, moisture may develop along walls. Allowing air to circulate against the walls will enable the moisture to evaporate.
- Keep the quantity of indoor plants to a minimum and don't allow indoor planted areas.

- Waterproof basements and walls below ground level. And use water-sealant paint on floors and walls.
- Place or adjust outside gutters and drains so that water does not collect near the outside walls. Check gutters and drains regularly to avoid clogs. Place lawn sprinkler systems so that they do not soak outside walls.
- Regularly inspect your collection for mold or mildew. This will allow you to catch any infestation before it becomes large. And continue to monitor potentially hazardous areas until the environment can be stabilized in an appropriate state.

What can you do if you have a mold outbreak?

There are a number of things you can do when faced with mold in your collection, but first you need to determine what has caused the mold to grow. Check the humidity and temperature. Chances are good that, for a large infestation, the cause at least partially lies there. Also look for a source of water, such as an unnoticed leak, a broken window, or moisture along outside walls. A third place to check is the heat-exchange coils in the heating/air conditioning system; they are a prime area for fungus growth and spore distribution. They can be cleaned using a commercial EPA registered cleaning solution, one such solution is Purolator 180 (antimicrobial HVAC treatment). You need to pinpoint whatever caused the mold to develop and then fix it, because until you solve that problem, mold will continue to grow, no matter how often you treat the affected material.

Your second response should be to isolate affected materials. If a small quantity of books is moldy, seal them in air-tight plastic bags. If the infestation is large, quarantine the area. You should wear rubber or plastic gloves and a dust or filtration mask whenever handling moldy materials. Isolating moldy books and papers serves two purposes: it minimizes the spread of mold, and it protects those persons who may have allergies or respiratory problems from harm.

Third, do what you can to increase air circulation and lower humidity. Open windows, provided it is not raining outside and the relative humidity outside is lower than that inside. Set up fans to increase air circulation. Set up dehumidifiers or readjust the HVAC system to lower the relative humidity. If you have a thermostat-controlled cooling system or one which simply lowers the temperature of outside air prior to ventilating it through the building, turn it off. This kind of "air conditioning" or cooling system does not provide humidity control and will in fact increase internal relative humidity because cold air cannot hold as much water as warm air. Furthermore, the moist heat-exchange coils in this system may be providing a fertile ground for the growth of mold, the spores of which are then distributed throughout the building via its ventilation system.

What other things can be done to deal with an outbreak, or to help prevent future ones?

Most authorities agree that fumigating collections with toxic chemicals is rarely necessary for dealing with mold and mildew problems. Storing collections in appropriate environmental conditions should prevent the need for fumigation. To quote Dr. Thomas Parker, of Pest Control Services, Inc.:

“Fumigation will not control mold and mildew if the library materials are placed back into the same conditions from which they came. In most instances library materials that have been

fumigated are then stored in areas which do not have an environment conducive to mold growth. The success of the fumigation is given as a reason for the control of the mold and mildew, when in fact, the new area in which the materials are stored is the governing factor as to why mold and mildew is now being controlled.”

Maintenance of proper environmental conditions will prevent mold growth. And if mold does occur, a relatively gentle form of cleaning along with improving the environment will solve the problem in most situations. I recommend that you try the following instead of chemical treatments.

- Determine the Cause: Check temperature and relative humidity levels; check to see if the material has been wet and, if so, why; check heat-exchange coils in air conditioning units.
- Isolate Material: Place individual items in sealed plastic bags; quarantine stacks; for large and heavy infestations, it may be necessary to restrict access to the building/room. Don't leave materials in plastic bags for extended periods of time; follow up with cleaning as soon as possible.
- Modify the Environment: Readjust relative humidity to the best of the HVAC system's ability; set up fans to keep air circulating in the affected area; install portable dehumidifiers in the affected area if the HVAC system cannot be controlled; turn lights on in affected areas for as long as possible during periods of obvious mold growth. Continuously record temperature and relative humidity until they stabilize at an acceptable level.
- Clean: Vacuum with a HEPA vacuum then wipe books or papers with a clean dry rag or a soft brush (wearing proper protective apparel); clean shelves, walls, floors, air conditioning heat-exchange coils, air vents, etc. with Lysol, Clorox, X-14, or other mold-killing solutions; if you are dealing with a small quantity of books you can set them out in the sun to dry out, otherwise use fans following the ethanol/vacuum cleaning.
- Remove Odors: Charcoal and/or baking soda can be used to remove the odor of mold, if the treatment has not done so. Simply place briquettes and/or bowls of baking soda in the area to absorb the odor. Do not wipe the books or paper with the charcoal or baking soda.
- Monitor: Keep watch on the affected area for several months beyond the mold outbreak and clean-up, even after the environment has been restored to conditions which inhibit mold growth.

Research and testing continue to assess the effectiveness of fungicides, to determine appropriate treatment procedures, and to identify molds and mildews and their characteristics. Studies might result in changes to existing procedures for mold control in the future. The [SOLINET Preservation Program](#) is able to provide advice and assistance in dealing with mold infestations in specific situations. Please call if we can help.

[soliNET Southeastern Library Network Inc.](#)

1438 West Peachtree Street NW • Suite 200 • Atlanta, GA 30309-2955 | 1.800.999.8558 toll free • 404.892.7879 fax



State Historical Society of Iowa

The Historical Division of the Department of Cultural Affairs

After the flood, DON'T

1. Don't remove standing water in a basement too fast. If the pressure is relieved too quickly it may put undue stress on the walls.
2. Don't dry buildings with mechanical dehumidifiers, which may draw out moisture too quickly and cause additional damage. Allow structures to dry naturally.
3. Don't scrub or brush mud and other deposits from materials. This may cause further damage.
4. Don't let water-damaged papers remain in wet boxes--remove water-damaged papers from wet boxes then air dry or freeze dry. (See below for drying procedures.)
5. Don't open any books or albums that were completely submerged. (Wet paper is very weak and will tear.)
6. Don't keep objects in dark, hot, stagnant air with high humidity--these conditions encourage mold.
7. Don't try to separate bundles of saturated paper.

After the flood, DO:

1. Do enhance drying out of buildings by carefully removing mud, standing water, and water-logged furnishings and debris.
2. Do remove residual moisture gradually by allowing structures to dry naturally. Open doors and windows.
3. Do document the damage for insurance purposes by taking notes or photographs.
4. Do BEFORE removing items from water, prepare a clean, dry, well-ventilated temporary area for sorting and storing your objects. Wet objects should be moved only once because they are fragile, so setting aside such an area is vital.
5. Do wear rubber gloves, and, if possible, a face mask, when handling items.
6. Do provide support for damaged objects when moving them, such as a cart, or a flat, sturdy surface.
7. Do call an expert if in doubt about how to salvage any materials.

State Historical Society of Iowa

402 Iowa Avenue
Iowa City, Iowa
52240
319.335.3916

600 E. Locust
Des Moines, Iowa
50319
515.281.5111

Disaster Supplies

Packing supplies:

- Cardboard boxes (if you are going to freeze or freeze dry books immediately; cardboard absorbs moisture)
- Plastic crates (if there will be any delay in freezing)
- Plastic garbage bags to line cardboard boxes, if plastic crates aren't available
- Pencils or indelible pens or markers for marking boxes
- Freezer or wax paper

Air-drying supplies:

- Paper towels or unprinted newspaper or blotting paper, for interleaving
- Bone folders and microspatulas for separating wet pages
- Fishline or clothesline for hanging books or documents
- Electric fans
- Dehumidifiers
- Heavy duty electric cords

Cleaning supplies:

- Paper toweling
- Sponges, mops and pails
- Rubber gloves
- Respirator or mask
- Goggles
- New plastic garbage cans (or plastic trays or dishpans) filled with clean cold water for rinsing mud covered materials
- Protective clothing
- Lysol cleaner or spray, for cleaning and spraying dirty or moldy storage areas

Miscellaneous needs:

- Flashlights
- Carts for transporting loaded boxes
- Cleared area and tables in which to sort, clean and pack materials

Sources:

- Freezing: See sections "[Cold Storage Facilities in Iowa](#)" and "[Disaster Recovery Suppliers, Services and Bibliography](#)"
- Local hardware or lumber stores
- Local newspaper offices
- Local drug stores

PRESS RELEASE

DATE: Summer 1998

For more information contact:

Sarah Stout
AIC
Tel: 202/452-9545
Fax: 202/452-9328

Sonia Dingilian
Heritage Preservation
Tel: 202/634-1422
Fax: 202/624-1435

Tips for the Care of Water Damage to Family Heirlooms and Other Valuables

Washington, D.C.--The American Institute for Conservation of Historic and Artistic Works (AIC) and the Heritage Preservation offer the following general recommendations for homeowners who have had family heirlooms and other valuables damaged by flooding. These recommendations are intended as guidance only and neither AIC nor Heritage Preservation assume responsibility or liability for treatment of water-damaged objects.

Ten Tips for the Homeowner

1. If the object is still wet, rinse with clear, clean water or a fine hose spray. Clean off dry silt and debris from your belongings with soft brushes or dab with damp cloths. Try not to grind debris into objects; overly energetic cleaning will cause scratching. Dry with a clean, soft cloth. Use plastic or rubber gloves for your own protection.
2. Air dry objects indoors if possible. Sunlight and heat may dry certain materials too quickly, causing splits, warpage, and buckling. If possible, remove contents from wet objects and furniture prior to drying. Storing damp items in sealed plastic bags will cause mold to develop. If objects are to be transported in plastic bags, keep bags open and air circulating.
3. The best way to inhibit the growth of mold and mildew is to reduce humidity. Increase air flow with fans, open windows, air conditioners, and dehumidifiers. Moderate light exposure (open shades, leave basement lights on) can also reduce mold and mildew.
4. Remove heavy deposits of mold growth from walls, baseboards, floors, and other household surfaces with commercially available disinfectants. Avoid the use of disinfectants on historic wallpapers. Follow manufacturers' instructions, but avoid splattering or contact with objects and wallpapers as disinfectants may damage objects. *Note: exposure to molds can have serious health consequences such as respiratory problems, skin and eye irritation, and infections. The*

use of protective gear, including a respirator with a particulate filter, disposable plastic gloves, goggles or protective eye wear, and coveralls or a lab coat, is therefore essential.

5. If objects are broken or begin to fall apart, place all broken pieces, bits of veneer, and detached parts in clearly labeled, open containers. Do not attempt to repair objects until completely dry or, in the case of important materials, until you have consulted with a professional conservator.
6. Documents, books, photographs, and works of art on paper may be extremely fragile when wet; use caution when handling. Free the edges of prints and paper objects in mats and frames, if possible. These should be allowed to air dry. Rinse mud off wet photographs with clear water, but do not touch surfaces. Sodden books and papers should also be air dried or kept in a refrigerator or freezer until they can be treated by a professional conservator.
7. Textiles, leather, and other "organic" materials will also be severely affected by exposure to water and should be allowed to air dry. Shaped objects, such as garments or baskets, should be supported by gently padding with toweling or uninked, uncoated paper. Renew padding when it becomes saturated with water. Dry clean or launder textiles and carpets as you normally would.
8. Remove wet paintings from the frame, but not the stretcher. Air dry, face up, away from direct sunlight.
9. Furniture finishes and painting surfaces may develop a white haze or bloom from contact with water and humidity. These problems do not require immediate attention; consult a professional conservator for treatment.
10. Rinse metal objects exposed to flood waters, mud, or silt with clear water and dry immediately with a clean, soft cloth. Allow heavy mud deposits on large metal objects, such as sculpture, to dry. Caked mud can be removed later. Consult a professional conservator for further treatment.

As noted above, these guidelines are general in nature. It is strongly recommended that professional conservators be consulted as to the appropriate method of treatment for household objects. Professional conservators may be contacted through the FREE Conservation Services Referral System of the American Institute for Conservation of Historic and Artistic Works (AIC), 1717 K Street, NW Suite 301, Washington, DC 20006; 202/452-9545, fax: 202/452-9328. Based on a complete description of the artifact, a computer-generated list of conservators will be compiled and grouped geographically, by specialization and by type of service provided. A brochure, enclosed with the listing, will explain the referral system, provide information on how to select a conservator, and outline general business procedures.

"What Is Conservation?" (fact sheet), *Guidelines for Selecting a Conservator* (brochure), *Caring for Your Treasures: Books to Help You* (bibliography), and *Caring for Special Objects* (brochure) are also available from AIC. "Emergency Preparedness and Response: Federal Aid for Cultural Institutions During an Emergency" (brochure) is available from Heritage Preservation, 1730 K St., NW, Suite 566, Washington, DC 20006; 202-634-1422, fax: 202-634-1435, www.heritagepreservation.org.

For more information, contact the AIC or NIC.

Heritage Preservation The American Institute for Conservation of Historic &
1730 K Street, NW, Suite Artistic Works

566
Washington, DC 20006
Tel: 202/634-1422
Fax: 202/624-1435

1717 K Street, NW, Suite 301
Washington, DC 20006
Tel: 202/452-9545
Fax: 202/452-9328

DRYING YOUR MATERIALS:

Items that are damp should be air-dried. Place them in a cool, dry space equipped with fans. Items that have been completely soaked, that cannot be air-dried within 48 hours, should be freeze-dried. Wrap them in freezer or waxed paper, and store them in a freezer. Freezing stalls the growth of mold and, most importantly, buys time. Please note: Consult professional experts before you unfreeze your items.

Below are instructions from the American Institute for Conservation and the National Park Service (in charge of the National Register of Historic Places) on how to properly dry various water-damaged materials and structures.

Buildings: Remove water-soaked insulation from the attic and, if possible, from behind walls. Allow plaster to dry gradually, because forced drying may cause further damage.

Framed artwork: Remove frames from paintings in a clean, dry place. Keep wet paintings horizontal and paint-side up. For art on paper or photographs: If image appears stuck to glass, leave in frame and dry glass-side down.

Photographs: Rinse mud off photos (using gentle water stream or by immersion and gentle agitation). Thoroughly wet photos can stay wet in a container of clean water. Dry or freeze within 48 hours. Freeze or air dry damp or partially wet photographs.

Wet or partly wet books: Pack these snugly, spine down, and freeze.

Damp books: Air dry--stand upright on paper towels about every 50 pages. Replace paper toweling frequently.

Clothing/textiles: Air dry or bag wet textiles in plastic and freeze. Dip half-saturated textiles in clean water and air dry or freeze.

Furniture (wood): Lift furniture above water level. Dab dry with clean cloths. If mud-covered, rinse immediately with clean water. Wrap with plastic and dry slowly, under weights if possible. Leave drawers in place but remove contents. Don't stack furnishings that might stick together.

Furniture (upholstered): Try to dry a bit more slowly than plain wood furniture.

Baskets: Pad basketry with uninked newsprint; keep lids on; dry slowly.

Wood, ceramics, metal: Rinse in a mild solution of water and gentle, non-detergent cleaner. Air dry.

SALVAGE OF WATER-DAMAGED ARCHIVAL COLLECTIONS

SALVAGE AT A GLANCE

Material	Priority	Handling Precautions	Packing Method	Drying Method
Paper				
Manuscripts, documents and small drawings	Freeze or dry within 48 hours	Don't separate single sheets	Interleave between folders and pack in milk crates or cartons	Air, vacuum, or freeze dry
Watercolors, and other soluble media	Immediately freeze or dry	Do not blot	Interleave between folders and pack in milk crates or cartons	Air or freeze dry
Maps, oversize prints and manuscripts	Freeze or dry within 48 hours	Don't separate single sheets	Pack in map drawers, bread trays, hat boxes or poly-covered plywood	Air, vacuum, or freeze dry
Coated papers	Immediately pack, then freeze or dry within 48 hours		Keep wet in containers lined with garbage bags	Freeze dry only
Framed prints and drawings	Freeze or dry within 48 hours		Unframe if possible, then pack as for manuscripts or maps above	Once unframed and unmatted, air or freeze dry
Books				
Books and pamphlets	Freeze or dry within	Do not open or	Separate with	Air, vacuum, or

	48 hours	close, do not separate covers	freezer paper, pack spine down in milk crate or cardboard box	freeze dry
Leather and vellum bindings	Immediately freeze	As above	As above	Air or freeze dry
Books and periodicals with coated papers	Immediately pack. Freeze or dry within 48 hours	As above	Keep wet; pack spine down in containers lined with garbage bags	Freeze dry only
Paintings				
Paintings	Immediately dry	Drain and carry horizontally	Face up without touching paint	Air dry. See instructions
Floppy Diskettes				
Floppy Diskettes	Immediately pack	Do not touch diskette surface with bare hands	Contact supplier for best method	Contact supplier for best drying method
Sound & Video Recordings				
Discs	Dry within 48 hours. Freezing is untested if it is necessary, freeze at above 0 F (-18 C)	Hold disks by their edges. Avoid shocks	Pack vertically in ethafoam-padded plastic crates	Air dry
Sound and Videotapes	Freezing is untested; if it is necessary, freeze at above -10 C		Pack vertically into plastic crates or cardboard carloads. Don't put any heavy weight on the sides of reels or cassettes	Air dry

Photographs				
Wet Collodion photographs (ambrotypes tintypes, pannotypes, wet collodion negatives)	Recovery rate is low. Immediately dry	Handle with care- -glass supports or glazing	Horizontally in padded container	Air dry face up. Never freeze
Daguerreotypes	Immediately dry	Handle with care- -usually cased behind glass	Horizontally in padded container	Air dry face up
Nitrates with soluble emulsions	Immediately freeze	Do not blot		Air dry; test freeze drying
Prints negatives and transparencies	Freeze or dry within 72 hours. Salvage order: 1)color photographs 2)prints 3)negatives and transparencies	Do not touch emulsions with bare hands	Keep in cold water. Pack in containers lined with garbage bags	Order of preference: 1)air dry 2)thaw and air dry 3)freeze dry. Do not vacuum dry
Motion Pictures	Rewash and dry within 72 hours		Fill film cans with cold water and pack in plastic pails or cardboard cartons lined with garbage bags	Arrange For film processor to rewash and dry
Microfilm rolls	Rewash and dry within 72 hours	Do not remove from boxes; hold cartons together with rubber bands	Fill boxes with water and pack (in blocks of 5) in a cardboard box lined with garbage bags	Arrange for a microfilm processor to rewash and dry
Aperture cards	Freeze or dry within 48 hours		Keep wet inside a container lined with garbage bags	Air dry
Jacketed microfilm	Freeze or dry within		Keep wet inside a container lined	Air dry

	72 hours		with garbage bags	
Diazo fiche	Last		In drawers or cartons	Air dry

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The general recommendations provided are intended as practical guidance in The recovery of water-damaged artifacts These recommendations are intended as guidance only and neither the AIC or NIC assume responsibility or liability for treatment of water-damaged objects.

SALVAGE OPERATIONS FOR WATER DAMAGED COLLECTIONS

A. GENERAL

1. Designate (preferably before the disaster) a Recovery Director. Know how to find a recovery specialist or use a conservator or other staff member trained in dealing with emergency salvage.
2. Do not enter the building until it has been designated as safe. Confer with the maintenance director, fire and police departments.
3. Recovery Director assembles the Disaster Team.
4. The Recovery Director and Recovery Specialist, accompanied by the Recorder and a photographer, will assess the scene of the disaster. The latter three will survey and photograph the damage.
5. Decide whether the building will stay open or closed so staff can participate in salvage operations.
6. The Recovery Director ensures that he/she has an office or desk near the site and is accessible by phone or walkie-talkie.
7. The logistics manager arranges for emergency facilities and supplies. Arrangements should be made for team members--coffee, portable toilets, etc.
8. The Recovery Director will coordinate with the maintenance director to:
 - o Reduce the temperature to less than 18°C (65°F) by turning down the heat.
 - o Lower relative humidity by adjusting the humidification system or installing dehumidifiers. Monitor.
 - o Circulate air with fans. Open doors if security is available.
9. Obtain generators if the electricity is off. Use safely grounded, waterproof cords.
10. The Recovery Director will delegate teams for salvage. Team members will be briefed and assigned to:
 - o Prepare packing materials (cubing freezer paper, assembling cardboard boxes) and move to packers.
 - o Pack the damaged collections. Begin with the wettest objects and items on the floor. See packing instructions for the materials being handled.
 - o Move crates and boxes by hand trucks and pallet movers if possible.

11. The Recorder numbers the crates and records their contents. If catalogue numbers aren't evident, note the location where the object was found. Record the condition of the contents as wet, partially wet, or damp. Label crates with tyvek tags; mark cardboard boxes directly.
12. If the damage is substantial and salvage will take more than 10 hours, loosen tightly packed document boxes, books and pamphlets so they do not jam into the shelves.
13. Do not separate the remaining dry books and documents when the relative humidity is high. If the RH remains high during cleaning and repairing of the storage areas, remove to an air conditioned room. However, evacuate undamaged diskettes because they are sensitive to a high relative humidity.
14. Meetings will be held at the beginning and end of each day to review strategy end to keep up morale.
15. The shelves will be repaired and cleaned after the books and documents are removed,

B. GUIDELINES FOR PACKING

Be extremely careful when handling wet materials. All of them are very fragile, including their paper boxes. If the boxes have disintegrated replace them with new containers. Don't unpack structurally sound containers (although they may be reinforced by packing inside plastic crates). Fill cartons and crates three-quarters full. Keep identification labels with objects. (Don't mark wet paper, but picture frames and reels can be marked with a grease pencil.) To avoid mechanical damage, do not stack material in piles or on the floor.

PAPER

Single sheets of paper: Do not try to separate but interleave the folders every two inches with freezer paper and pack.

Watercolors, maps, and manuscripts with soluble media: Do not blot surface. Quickly freeze or dry.

Coated papers: Keep wet by packing in boxes lined with garbage bags, then freeze.

Framed prints and drawings: If time and space permit, unframe and pack as for single sheets.

Maps, plans, oversize prints, and manuscripts: Sponge standing water out of map drawers. Remove the drawers from the cabinet. ship and freeze them stacked up tenth 1" x 2" strips of wood between each drawer. Pack loose, flat maps in bread trays, flat boxes, or plywood sheets covered in polyethylene. Bundle rolled maps very loosely to go in small numbers to the freezer, unless facilities are available for conservators to unroll them.

BOOKS

Don't open or close wet books or remove wet book covers. If the water is dirty, wash the books before freezing. Do not wash open books and those with water soluble media. Wash closed

books in tubs of cold running water and dab away (do not rub) mud with a sponge. Time and facilities may limit this treatment.

Lay a sheet of freezer paper around the cover, and pack spine down in a milk crate or cardboard carton.

Leather, parchment and vellum binding are an immediate priority because they distort and disintegrate in water. Books with coated papers should be kept wet by packing inside boxes lined with garbage bags, then frozen.

PAINTINGS

Drain off excess water and take to a work area for immediate drying. Transport horizontally if you can. If not carry the painting facing toward you, holding the side of the frame with the palms of your hands. Larger paintings should be carried by two people. The order of removal and treatment is: 1) the most highly valued; 2) the least damaged; 3) slightly damaged; and 4) severely damaged.

FLOPPY DISKETTES

If the diskettes are wet pack them upright in containers of cold distilled water. Make arrangements to air dry.

SOUND AND VIDEO RECORDINGS

Phono discs: If storage boxes are badly damaged, transfer the discs up to five at a time, to milk crates. Pad the bottoms of the crates with ethafoam and interleave with ethafoam every 25 records to absorb shocks. Always support the discs vertically and hold the discs by their edges. Avoid shocks and jolts during transport.

Sound and video tapes: Pack vertically into egg crates or cardboard cartons. Do not put excessive weight on the sides of the reels or cassettes.

PHOTOGRAPHIC MATERIALS

Salvage without delay these historic photographs:

Wet collodion photographs (ambrotypes, tintypes, pannotypes and wet collodion glass negatives): Salvage first and air dry immediately. Both immersion and freezing will destroy the emulsion.

Daguerreotypes: Salvage and air dry.

Nitrates with softening emulsions: Freeze immediately and make arrangements to freeze dry. Emulsions are water soluble and could be lost.

Other photographs should be kept wet in containers of fresh cold water until they are either air dried or frozen. If allowed to partially dry they will stick together. Pack inside plastic garbage pails or garbage bags inside boxes. Keep to a minimum the immersion time to treatment or freezing.

Prints, negatives, and transparencies: Salvage color photographs first then prints, then black and white negatives and transparencies. If facilities and personnel are available, air dry. Pack and freeze if not.

Motion pictures: Open the film can, fill it with water and replace lid. Pack into plastic pails or cardboard cartons lined with garbage bags. Ship to film processor for rewashing and drying.

MICROFORMS

Microforms in rolls: Do not remove the films from their boxes. Hold cardboard boxes (and their labels) together with rubber bands. Fill boxes with water then wrap 5 cartons of film into a block with plastic wrap. Pack the blocks into a heavy duty cardboard box lined with 3 garbage bags. Label as wet film and ship to a microfilm processor.

Aperture cards: Pack and freeze.

Microfilm strips in jackets: Pack and freeze.

Diazo microfiche: Pack, freeze, and make arrangements to air dry.

PARCHMENT AND VELLUM

Separate from other documents, pack in crates or flat boxes, and freeze.

C. RECOVERY METHODS

For materials requiring immediate attention or unusual treatments.

PAINTINGS

Ideally, this treatment should be done by a conservator. Initially, set up tabletops padded with blotters and covered with plastic.

Separate the merely wet paintings from those showing structural damage. Signs of structural damage are tears in the canvas, flaking, lifting, and dissolving of paint and ground layers. Let the structurally damaged paintings dry, face up in a horizontal position, on the tables.

Structurally sound paintings on canvas are dried in the following way: Set up several more layers of blotter on the table, followed by a layer of tissue paper. Unframe the painting, but don't

remove it from its stretcher. Lay it face down on this surface, making sure the tissue is not wrinkled. Cut blotters to the inside dimensions of the stretcher frame. Cut a sheet of plywood or thick masonite to the same dimensions, or smaller to fit inside the stretcher keys. Cover the back of the canvas with a blotter (if the canvas is large and more than one blotter is necessary, butt the blotters end-to-end), then the board, and finally the weights. Change the blotter until the canvas is dry. If the tissue on the front has a tendency to stick to the paint layer, leave it in place.

FLOPPY DISKETTES

The diskettes should be removed from their jackets, washed, and dried. Cut the edge of the jacket with non-magnetic scissors and remove the diskette with gloved hands. Wash in several water baths (photo trays) or distilled water, and dry with lint free towels. When the crisis is over, insert the diskettes into a new jacket (cannibalized from a new diskette; this can be reused) and copy with a disk drive. The drive heads should be cleaned frequently.

SOUND AND VIDEO RECORDINGS

Phono discs: Remove the discs from their sleeves and jackets. If labels have separated, mark the center of disc with a grease pencil and keep track of the label. Jackets, sleeves, and labels may be dried like other paper materials. If dirt has been deposited on the discs, they may be washed in a 1% solution of Kodak Photo Flo in distilled water. Air dry the discs on supports that permit free circulation of air.

Reel to reel tapes: If the exterior of the tape is dirty, wash the tape (still wound on its reel) with lukewarm water. Support the tape vertically and air dry it, or air dry by laying it on sheets of newsprint spread over plastic covered tables. The box can be air dried as well. If the reels are still dirty, remove the tape and wash the reel with detergent and water. An alternative is to replace the reel. Return the tape to its original box, after the box has dried. Replace the box if badly damaged.

Videocassettes: Dismantle the cassette and dry as for reel to reel tapes.

Audio cassettes: If there are no master copies, dismantle the cassette and air dry the tape as above. Rerecord the tape after drying. It is difficult to determine the condition of sealed cassettes. Copy them in any case.

PHOTOGRAPHIC MATERIALS

The first priority is to dry wet collodion photographs and daguerreotypes. The recovery rate may not be very high.

Case photographs: Remove the assembly from the case. Carefully fold back the preserver frame. Cut the sealing tape (if present) and take the assembly apart. Place daguerreotypes face up on blotters with the case components beside them. Wet collodion photographs should be dried in a similar way emulsion side up.

Wet collodion glass negatives and unmounted case photographs: Dry emulsion side up on blotters.

Prints negatives and transparencies: In order of preference the drying methods are: air dry, freeze, thaw and air dry, and freeze dry. Vacuum drying will make the photographs stick together in a lump. If the photographs have been immersed in dirty water, clean them before air drying or freezing. Time and facilities may modify the following:

Black and white prints and negatives: Wash for half an hour in changes of cold water. Gently swab off stubborn dirt from the surface. Rinse with Kodak Photo Flo solution.

Color prints: Wash as above but for a shorter time.

Color negatives and transparencies: Wash as for black and white negatives. A few varieties require bathing in a stabilizer prior to drying.

Color negatives: Rinse for 1 minute using Kodak C41 stabilizer.

Ektachrome Transparencies: Rinse 10-15 seconds in Kodak E6 stabilizer.

Kodachrome: No stabilizer required.

Eastman Color Film: Send to a Kodak Laboratory.

Air drying. Remember to keep the photographs wet until they are separated from each other and their enclosures. If the photographs have been previously frozen thaw them. If it appears that the photographs could dry and stick together during thawing immerse again in cold water. Dry the photographs emulsion side up on blotters, paper or nylon screen.

MICROFORMS

Aperture cards: At present the only treatment is a time-consuming one. Remove the film chips from their mounts. Wash the chips and remount them.

Microfilm strips in jackets: Cut the strips from the jackets with sleeve cutters. Wash and dry the film and insert into new jackets.

Diazo microfiche and rolls: Check for readability. If the photograph has blistered, discard and replace with a print from the security copy. If it has not delaminated, wash in cool water and dry on blotters or a lint-free cloth.

D. POST-DISASTER

Review disaster operations. Change plan accordingly. Send thanks to all who helped. Inspect collections over the next year to prevent mold outbreaks. Publish the results to aid other institutions.

Betty Walsh, Conservator
Provincial Archives of Branch Columbia
655 Belleville Street
Victoria, BC V8V 1X4

Notes for the Chart

(From Betty Walsh Conservator)

The chart was written as a ready reference in our disaster plan. It is modeled on a table of recovery priorities written by Julia Eulenberg. I have enlarged it to include handling and packing procedures for the variety of materials in our collection. The following references were used:

Barton John P. and Welheiser Johanna G. ed. *An Ounce of Prevention: A Handbook on Disaster Contingency Planning for Archives, Libraries, and Record Centres*. Toronto: Toronto Area Archivists Group, 1985.

Canadian Conservation Institute. *Emergency Treatment for Water-Damaged Paintings on Canvas*. CCI Note INS. Ottawa: CCI, April 1986.

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Hendriks. Klaus B. and Lesser Brisk. "Disaster Preparedness and Recovery: Photographic Models." *American Archivist* 46 (Winter 1983).

Langelier, Gilles. and Wright, Sandra. "Contingency Planning for Cartographic Archives." *Archivaria* 13 (Winter 1981-82): 47-58.

McWilliams, Jerry. *The Preservation and Restoration of Sound Recordings*. Nashville: American Association for State and Local History, 1979.

Public archives of Canada. "Archives Branch Contingency Plan." *Ottawa Public Archives*, September 21, 1982.

Upton M.S. and Peterson. C. *Disaster Planning and Emergency Treatments in Mustang, Art Galleries, Libraries, Archives, and Allied Institutions*. Canberra: Institute for the Conservation of Cultural Material Incorporated, 1978.

Peter. *Procedures for Salvage of Water-Damaged Library Materials* 2nd ed. Washington: Library of Congress, 1979.

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SALVAGE OF WATER-DAMAGED COLLECTIONS

SALVAGE AT A GLANCE

(Addenda)

Material	Priority	Handling Precautions	Preparation/Packing Method	Drying Method
Textiles				
Small flat textiles	Freeze or air dry within 48 hours	Do not unfold if fragile layers are stuck together	Drain and blot to remove excess water; separate items with freezer paper or wax paper to prevent dye staining between items *	Air or freeze dry. ** Do not freeze beadwork or painted and stenciled items
Beadwork and painted fabrics	Air dry within 48 hours	Use support to move	Drain and blot to remove excess water. Separate items with freezer paper or wax paper to prevent dye staining between items	Air dry only
Framed textiles	Freeze or air dry within 48 hours	Unframe; unmount if possible	Drain and blot to remove excess water. Separate items with freezer paper or wax paper to prevent dye staining between items	Air or freeze dry **
Large flat textiles (blankets, coverlets)	Freeze or air dry within 48	Drain to reduce water weight; use	Drain and blot to remove excess water; separate items with freezer paper or wax	Air or freeze dry **

	hours	support to move	paper to prevent dye staining between items.	
Garments	Freeze or air dry within 48 hours	Bodice boning, metal fasteners, buttons etc. will tear easily through fragile wet fabrics. Use support to move.	Drain and blot to remove excess water. Separate items with freezer paper or wax paper to prevent dye staining between items	Air or freeze dry ** If air drying, pad out to restore shape with uninked paper, toweling, net or other colorfast fabric
Tapestries and rugs	Freeze or air dry within 48 hours	Extremely heavy and fragile when wet; use support to move	Drain, roll with toweling to remove excess water. Unroll remove toweling; repeat if needed. Fold or roll.*	Air or freeze dry **
Basketry	Air dry as soon as possible	Fragile and heavy when wet; use support to move	Remove mud and debris with clear water. Drain and blot to remove excess water. Separate items with freezer or wax paper	Air dry. Pad out with uninked paper, toweling or other colorfast materials
Leather and rawhide	Air dry within 48 hours	Leather (especially items with red-rot) may be extremely fragile when wet; use support to move	Rinse or sponge with clear water to remove mud. Drain and blot to remove excess moisture. Pad shaped artifacts with toweling or uninked paper	Air dry
Buckskin and other flexible leathers	Air dry within 48 hours	Leather may be extremely fragile when wet; metal fasteners may tear through; use support to move	Rinse or sponge with clear water to remove mud. Drain and blot to remove excess moisture.	Air dry. May require manipulation while drying to retain flexibility; contact a conservator
Natural History	Freeze or air	Use gloves to	Drain and blot to remove	Air or freeze dry

Specimens	dry within 48 hours	handle; wear surgical mask. Many stuffed mounts contain arsenic or other pesticides and may be extremely hazardous to your health	excess water. Separate items with freezer or wax paper. Support with padding. Isolate from other objects in boxes lined with plastic sheeting and limit handling to avoid contamination	
Bone, hair, horn, ivory, shell	Begin to air dry within 48 hours	May be extremely fragile when wet. Use support to move	Rinse or sponge with clear water to remove mud and debris. Drain and blot excess moisture. Separate items with freezer or wax paper to prevent bleeding of colors between objects. Transport in boxes lined with open polyethylene bags	Air dry slowly on non-rusting screens
Metal				
Small metal objects	Air dry as soon as possible	Use gloves when handling. Mud is abrasive and can scratch surfaces	Remove mud and debris with clear Water. Drain and blot with toweling. Pack when dry if possible. Pad loosely to prevent abrasion but allow air circulation	Air dry as soon as possible
Iron objects	Air dry as soon as possible	Use gloves when handling. Mud is abrasive and can scratch surfaces	Remove mud and debris with clear water. Drain and blot with toweling. If possible pack only when dry. Separate with padding	Air dry as soon as possible
Painted metal objects(including machinery, equipment).	Rinse mud off before drying	Avoid cleaning flaking or peeling areas. Painted surfaces or other applied decorations or	Keep flaking areas horizontal face	Air dry as soon as possible

		labels may be soft and fragile; avoid touching		
Large metal objects (sculpture, architectural elements)	Air dry; mud and other deposits can be removed later			Contact a conservator for later cleaning and stabilization

Wood

Wood sculpture (unpainted)	Begin to air dry within 48 hours		Remove mud and debris with clear water. Drain and blot to remove excess water. Wrap in blotting materials under loosely draped polyethylene sheeting	Air dry slowly under polyethylene sheeting. Use fans to increase air circulation but not directed at objects
Polychromed wood	Begin to air dry within 48 hours	Surfaces may be extremely fragile and flaking; avoid touching painted areas. Keep flaking areas in horizontal position if possible	Wrap under loosely draped polyethylene sheeting, avoiding contact with painted surface Contact a conservator for advice immediately	Air dry slowly under polyethylene sheeting; may require immediate attention by a conservator

Furniture

Solid wood pieces	Wash off wet mud with water as soon as possible. Dab dry. Dry slowly. Wipe with disinfectant if	If joints saturated, tie up with cord or thick string	Do not stack or place other objects on top to dry	Air dry under cover if possible. Provide good air circulation. Dry slowly to minimize cracking and
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	necessary. 50% alcohol in water will discourage mold			splitting. Expect surface coatings to discolor. Contact a conservator
Veneered pieces	As above. Dry under weights to hold veneer in place	Handle as little as possible	As above	As above. Air dry in "envelope" of cotton or plastic to catch pieces that may fall off. Keep all pieces for replacement when piece is dry
Partially upholstered	As above. Remove lift-out seats. Rinse off both pieces. Dab wood dry. Wrap textile seat in clean cloth or towel to wick dry	Keep pieces together	As above	Air dry as above
Upholstered overall	Spray off excess mud with water. Remove cushions and dry separately. Wrap in clean sheet or towels and wick dry	Handle all furniture with gloves		Air dry as above. Use fans if electricity is safe to use
Ceramics/Porcelain	Glazed pieces can wait until	Note that many pieces have old	Bag or box when possible and pack dry if possible. Wrap	Air dry

	there is time to wash them off. Gilded pieces should be dabbed off with a soft cloth	repairs & these repairs will part when immersed for any length of time. Keep pieces together in plastic bag or box. Label bags	pieces individually to prevent more damage.	
Unglazed Pottery/Porcelain	Wash off as soon as possible or dry with mud on and remove with a soft brush later	As above. Wrap when dry and store individually	As above. Can be packed in one box with dividers	Air dry
Painted Ceramics (unglazed)	Dry as is; consult a conservator	Wrap carefully. Store separately	As above	Air dry

* Corrugated cardboard boxes can be lined with garbage bags for freezing to prevent dyes from leaking. Do not overload boxes. "

**Consult a conservator about freeze-drying of these materials.

Format and original contents thanks to Betty Walsh, published in *WAAC Newsletter*, Volume 10:2, 1988. Addendum contributed by Kathy Francis, Pamela Hatchfield, Robert Herskovitz, Jane Hutchins, Jerry Podany, Barbara Roberts, Paul Storch and Deborah Trupin.

The general recommendations provided are intended as practical guidance in the recovery of water-damaged artifacts. These recommendations are intended as guidance only and neither the AIC or NIC assume responsibility or liability for treatment of water-damaged objects.

ADDENDUM (contributed by Barbara Roberts)

Furniture

Clean wet contents out of drawers. Replace drawers: they may be difficult to open when the piece dries, but if dried separately they may distort and not fit back in the piece.

Dry furniture out slowly with good air circulation to keep cracking and splitting to a minimum.

Expect finishes to turn white or to discolor. Consult a conservator for advice when the pieces are dry.

Watch for mold. If it develops, wipe off surfaces with 50% ethanol or denatured alcohol in water. Dry off surfaces with a soft cloth. The best way to keep mold from forming is to keep humidity down to below 75% and to keep air circulating.

Try to remove mud while it is still wet. Use plain water. A light spray is better than rubbing with a cloth.

Beware of health hazards associated with contaminated mud/water. Protect eyes, mouth, and hands. Wear rubber gloves. Use disinfectants to wash hands before eating.

The recommendations provided are intended as practical guidance in the recovery of water-damaged artifacts. These recommendations are intended as guidance only and neither the AIC nor NIC assume responsibility or liability for treatment of water-damaged objects.

Six Tips For Saving Wet Books

1. Insert a paper towel about every 50 pages.
2. Stand the book on end on several sheets of toweling.
3. Open only the covers.
4. Frequently turn the book over, so that the top and bottom are reversed, and replace the paper toweling when wet.
5. Make sure that there is good ventilation. A fan is a big help.
6. After the book dries, put weights on top of the book to flatten it out.

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DRYING WET BOOKS AND RECORDS*

There are currently five ways to dry wet books and records. All have undergone at least minimal testing under emergency conditions; several have been used extensively. These are described to assist you in making the best choice given your circumstances: cause of damage, level of damage, numbers involved, rarity/scarcity, personnel available, budget available, drying service available. Advice from a conservator or preservation administrator experienced in disaster recovery can be helpful before making the final selection(s). Successful recovery operations have proven that it is less expensive to dry original collections than to replace them, even if they are replaceable.

It is important to understand that no drying method restores materials. They will never be in better condition than they are when drying begins. If time must be taken to make critical decisions, books and records should be frozen to reduce physical distortion and biological contamination while decisions are made.

Air Drying. Air drying is the oldest and most common method of dealing with wet books and records. It can be employed for one item or many, *but is most suitable for small numbers of damp or slightly wet books and documents*. Because it requires no special equipment, it is often seen as an inexpensive method of drying. But it is extremely labor-intensive, can occupy a great deal of space, and can result in badly distorted bindings and textblocks. It is seldom successful for drying bound, coated paper. Book and paper conservators should always be consulted for the drying of rare or unique materials. They may choose to air dry items or may suggest one of the other alternatives.

Dehumidification. This is the newest method to gain credibility in the library and archival world, although it has been used for many years to dry out buildings and the holds of ships. Large, commercial dehumidifiers are brought into the facility with all collections, equipment, and furnishings left in place. Temperature and humidity can be carefully controlled to specifications. Additional testing is being undertaken, but the technique is certainly successful for damp or moderately wet books, even those with coated paper, as long as the process is

initiated before swelling and adhesion have taken place. The number of items is limited only by the amount of equipment available and the expertise of the equipment operators. This method has the advantage of leaving the materials in place on the shelves and in storage boxes, eliminating the costly step of removal to a freezer or vacuum chamber.

Freezer Drying. Books and records that are only damp or moderately wet may be dried successfully in a self-defrosting blast freezer if left there long enough. Materials should be placed in the freezer as soon as possible after water damage. Books will dry best if their bindings are supported firmly to inhibit initial swelling. The equipment should have the capacity to freeze very quickly, and temperatures must be below -10°F to reduce distortion and to facilitate drying. Documents may be placed in the freezer in stacks or may be spread out for faster drying. Expect this method to take from several weeks to several months, depending upon the temperature of the freezer and the extent of the water damage. However, caution is advised: with this method leaves of coated paper may adhere to one another.

Vacuum Thermal Drying. Books and records may be dried in a vacuum thermal drying chamber into which they are placed either wet or frozen. The vacuum is drawn, heat is introduced, and the materials are dried above 32°F . This means that the materials stay wet while they dry. It is a very acceptable manner of drying wet records, but often produces extreme distortion in books, and almost always causes blocking (adhesion) of coated paper. For large quantities of materials it is easier than air drying, and almost always more cost-effective. However, extensive rebinding or recasing of books should be expected. This method is a solution for materials that have suffered extensive water damage.

Vacuum Freeze Drying. This process calls for very sophisticated equipment and is especially suitable for large numbers of very wet books and records as well as for coated paper. Books and records are placed in a vacuum chamber frozen. The vacuum is pulled, a source of heat introduced, and the collections, dried *at temperatures below 32°F* , remain frozen. The physical process known as sublimation takes place, i.e., ice crystals vaporize without melting. This means that there is no additional swelling or distortion beyond that incurred before the materials were placed in the chamber.

Coated paper will dry well if it has been frozen or placed in the chamber within six hours after getting wet. Otherwise it may well be lost. Rare and unique materials can be dried successfully this way, but leathers and vellums may not survive. Photographs should not be vacuum freeze-dried unless no other possibility exists. Consult a photographic conservator. Although this method may initially appear to be more expensive due to the equipment required, the results are often so satisfactory that additional funds for rebinding are not necessary, and mud, dirt and/or soot is lifted to the surface, making cleaning less time consuming. If only a few books are dried, vacuum freeze drying can indeed be expensive. However, companies that offer this service are often willing to dry one client's small group of books with another client's larger group, thus reducing the per-book cost and making the process affordable when only a few books need to be dried.

HOW TO AIR DRY WET RECORDS

Wet records may be air dried if care is taken to follow guidelines suggested by preservation experts. The technique is most suitable for small numbers of records that are damp or water-damaged only around the edges. If there are hundreds of single pages, or if the water damage is severe, other methods of drying will be more satisfactory and cost-effective. Stacks of documents on coated, or shiny, paper must be separated immediately to prevent adhesion, or they must be frozen to await a later drying decision. Care must be taken with water-soluble inks as well. Records with running or blurred inks should be frozen immediately to preserve the written record. After drying, conservators can be contacted for advice and assistance.

If records must be air dried, the following steps will help achieve satisfactory results. Wet paper is extremely fragile and easily torn or damaged, so care must be exercised. Once wet, records will never look the same, and at least some cockling or distortion should be expected.

1. Secure a clean, dry environment where the temperature and humidity are as low as possible. The temperature must be below 70°F and the humidity below 50%, or mold will probably develop and distortion will be extreme.
2. Keep the air moving at all times using fans in the drying area. This will accelerate the drying process and discourage the growth of mold. If materials are dried outside, remember the prolonged exposure to direct sunlight may fade inks and accelerate the aging of paper. Be aware that breezes can blow away single records. Train fans into the air and away from the drying records.
3. Single leaves can be laid out on tables, floors, and other flat surfaces protected if necessary by paper towels or clean, unprinted newsprint. Or clotheslines may be strung close together and records laid across them for drying.
4. If records are printed on coated paper, they must be separated from one another to prevent them from sticking together. This is a tedious process, which requires skill and patience. Practice ahead of time will prove useful. Place a piece of polyester film on the stack of records. Rub it gently down on the top document. Then slowly lift the film while at the same time peeling off the top sheet. Hang the polyester film up to dry on the clothesline using clothespins. As the record dries, it will separate from the surface of the film. Before it falls, remove it and allow it to finish drying on a flat surface.
5. Once dry, records may be rehoused in clean folders and boxes. Or they may be photocopied or reformatted on microfilm or fiche. Dried records will always occupy more space than ones that have not been water-damaged.

HOW TO AIR DRY BOOKS

Air drying is most appropriate for books that are only damp or wet in places, such as along the edges. Books that are soaking wet should be vacuum freeze dried to minimize cockling of leaves and distortion of bindings. Books containing coated paper should be frozen while still wet and vacuum freeze dried. Books with running or blurred inks should be frozen immediately and also vacuum freeze dried.

1. Refer to steps 1 and 2 of the previous section.
2. Interleave every few pages, starting from the back of the book, turning pages carefully. For interleaving, use paper towels or clean, unprinted newsprint. Be careful not to interleave too much or the spine will become concave and the volume distorted. Complete the interleaving by

placing clean blotter paper inside the front and back covers. Close the book and place it on several sheets of absorbent paper. Change the interleaving frequently. Turn the book over each time it is interleaved.

3. When books are dry but still cool to the touch they should be closed and laid flat on a table or other horizontal surface, gently formed into the normal shape, with convex spine and concave front edge (if that was their original shape) and held in place with a light weight. Do not stack drying books on top of each other. In no case should books be returned to shelves until thoroughly dry; otherwise mold may develop, particularly along the inner margins.
4. Dampness will persist for some time in the inner margins, along the spine, and between boards and flyleaves. This is particularly true of volumes sewn on oversewing machines. Check often for mold growth while books are drying.
5. If the edges are only slightly wet, a book may be stood on end and fanned open slightly in the path of a flow of air (e.g. a fan). To minimize distortion of the edges, volumes should be laid flat under light pressure (e.g. paper-covered bricks) just before drying is complete.
6. If you can establish an air-conditioned room capable of maintaining a constant relative humidity of 25 to 35% and temperatures between 50 and 65°F, books with only wet edges can be dried successfully in approximately 2 weeks without interleaving. Do not try to dry books printed on coated paper by this method. In nearly every case, the only chance of saving such books is to freeze them while wet and dry by vacuum freeze drying.

Sally Buchanan: 8/92

* The author acknowledges the expertise from many sources who have contributed to the understanding of disaster recovery methods. These include Willman Spawn, Peter Waters, Olivia Primanis and the staff at NEDCC.

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**TECHNICAL
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EMERGENCY SALVAGE OF PHOTOGRAPHS

Because of the number of photographic processes and their wide variety, responsible advice for the emergency salvage of wet photographs is difficult to provide. Some processes can withstand immersion in water for a day or more, whereas others would be permanently disfigured or even destroyed by a couple of minutes exposure. In general wet photographs should be air dried or frozen as quickly as possible. Once stabilized by either of these methods, there is time to decide what future course of action to pursue.

Ideally salvage should occur under a conservator's supervision. A conservator can minimize damage to a collection if there is the opportunity to direct the salvage and treat the collection immediately after the damage has occurred. Time is of the essence. The longer the period of time between the emergency and salvage, the greater amount of permanent damage that will occur.

1. Minimize Immersion Time.

Photographs in water will quickly deteriorate: images can separate from mounts, emulsions can dissolve away or stick together, staining can occur. Mold is another problem. Mold begins to grow within 48 hours at 60% RH and 70°F. Mold often causes permanent staining and other damage to photographs. For these reasons photographs need to be dried as quickly as possible. If photographs cannot be dried they should be frozen.

2. Salvage Priorities for Wet Photographs

- In general films (plastic base materials) appear to be more stable than prints; therefore, prints should be salvaged first. Important exceptions include deteriorated nitrate and safety films, which are extremely susceptible to water damage.
- Processes that should be salvaged first include: ambrotypes, tintypes, collodion wet plate negatives, gelatin dry plate negatives, lantern slides, deteriorated nitrate or safety film,

autochromes, carbon prints, woodburytypes, deteriorated or unhardened gelatin prints, color materials. Many of these processes will not survive any immersion.

- Processes that are more stable in water include: daguerreotypes, salted paper prints, albumen prints, collodion prints, platinum prints, cyanotypes.

3. Air Drying Photographs.

- If personnel, space and time are available photographs can be air dried.
- Separate photographs from their enclosures, frames, and from each other. If stuck together or adhered to glass, set them aside for freezing and consult a conservator.
- Allow excess water to drain off the photographs.
- Spread the photographs out to dry, face up, laying flat on an absorbent material such as blotters, unprinted newsprint, paper towels, or a clean cloth.
- Photographs may curl during drying. They can be flattened later.

4. Freezing Photographs.

- If immediate air drying of photographs is not possible or if photographs are stuck together, freeze them.
- Place the photographs in small plastic bags before freezing, several to a bag.
- If possible, interleave photographs before freezing with a non-woven polyester material or wax paper. This will make them easier to separate when they are eventually treated.

5. Drying Frozen Photographs.

- Frozen photographs are best dried by thawing, followed by air drying. As a group of photographs thaws, individual photographs can be carefully peeled from the group and placed face up on a clean, absorbent surface to air dry.
- Vacuum thermal drying, where the frozen material is thawed and dried in a vacuum, is not recommended for photographs. Gelatin photographs undergoing this procedure have a tendency to severely mottle and stick together.
- Photographs can be vacuum freeze dried; in this process no thawing occurs. Gelatin photographs may mottle during the procedure, but they won't stick together.
- Wet collodion glass plates must never be freeze dried; they will not survive. This would be true for all similar collodion processes such as ambrotypes, collodion lantern slides, and tintypes.

6. Salvaging Slides.

- Slides can be rinsed and dipped in "Photo-flo", slide cleaner, or a similar commercial product and air dried, preferably hung on a line or propped on edge.
- Ideally, slides should be removed from their frames for drying and then remounted.
- Slides mounted between glass must be removed from the glass or they will not dry.

7. Call a Qualified Conservator.

Dried or frozen photographs are reasonably stable. Store them until you can talk to a conservator who has experience with photographs and can advise you of treatment needs.

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**TECHNICAL
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Emergency Salvage of Moldy Paper Materials

The following advice is offered in the context of a crisis situation and includes only basic stabilization techniques. It does not address the complexities and difficulties of dealing with wet and moldy materials. A professional conservator should be consulted if questions arise or if further treatment is necessary.

THE ONLY SURE WAY TO STOP MOLD GROWTH IS TO GET THE ITEM DRY OR FROZEN.

Remember that mold likes four things: moisture, heat, poor air circulation, and dark. The first step in fighting mold growth is to get wet or damp material dry. If you know you cannot get the material dry right away, it is best to freeze it, if a freezer is available. This will stabilize the material (mold will stop growing) until you have a chance to dry it. If the item is small enough, it can be placed in the freezer compartment of a home refrigerator; for large items a commercial freezer may be necessary.

Wet material should be dried in a cool dry space with good air circulation. An air conditioned space is the best for this purpose, but if that is impossible, use fans to circulate air (do not aim fans directly at the object, however, as the air pressure can cause damage). If possible, use a dehumidifier to remove moisture from the air. Place paper toweling or unprinted newsprint (regular newspapers may transfer print to the wet objects) under the drying items to absorb moisture, and change this blotting material often.

Air drying takes time and attention, since you must check drying materials often, and you must maintain cool, dry environment, additional mold will grow. Materials may be dried outside in the sun if the outside humidity is low, but be aware that sun may cause fading and other damage. Never leave materials outside overnight.

Unfortunately, "quick cures" that you may have heard about (such as using lysol and bleaching objects) are often ineffective, especially where large-scale damage is involved. These measures may even cause additional damage to items or be toxic to people.

Special attention should be paid to framed objects, such as prints and drawings, since they are especially vulnerable to mold growth. A frame provides an ideal environment for mold; the back is dark, air does not circulate, and humidity is trapped inside. Framed materials should be unframed immediately, and dried as above. If the item appears to be stuck to the glass in the frame, remove the backing materials from the frame and leave the item in the frame and attached to the glass. Place the framed item in a cool, dry space as described above. Do not attempt to unstick the item from the glass; that should be left to a professional conservator.

Once moldy material is dry, take a soft, wide brush (such as a watercolor wash brush) and lightly brush the powdery mold off the surface of the item. Be sure not to rub the mold into the surface, since that will attach it permanently to paper fibers or the cover of a book. Plan to brush off mold outdoors, in front of a window exhaust fan, into a ventilation hood, or in some area designed to remove the mold spores from indoor environments. Mold spores will float in the air indoors, settle on surfaces, and remain to infect other items if conditions are favorable.

An alternative is to vacuum the mold (this should also be done outdoors), but **DO NOT VACUUM THE ITEM DIRECTLY**, since the suction can easily damage fragile materials. Instead, brush the powdery mold off into the vacuum nozzle. You may want to put a piece of cheesecloth over the nozzle as a precaution. Get a special filtration vacuum if possible, such as those used in computer rooms. Otherwise, be careful where you use the vacuum, since a normal vacuum will simply exhaust the mold spores out the back.

Many people are allergic to mold spores. Repeated exposure or exposure to high levels of the spores can cause allergies in people who previously were not sensitive to molds. Some molds are toxic. If you have any reason to believe that you are sensitive to molds or have other health problems which may be made worse by mold exposure, talk to your doctor before trying to clean moldy objects.

There are methods of protecting yourself when working with moldy objects. The best way is to brush spores outside or into a ventilation system while wearing protective equipment. Thin surgical or vinyl gloves will protect your hands (and also protect the object from skin oils). Wearing a dust mask will keep spores out of your respiratory system.

If you have heart or breathing problems which may be made worse by the stress of breathing through a mask, check first with your doctor. Some doctors also do not want pregnant women to wear dust masks or respirators.

Drug and hardware stores sell pollen dust masks which may be adequate for light work. For heavier work use masks designed for toxic dusts. These masks will be labeled "NIOSH-approved for toxic dusts." These are available from industrial safety suppliers. Two large suppliers are Aldrich Safety Products (1-800558-9160) and Lab Safety Supply (1-800-3560783).

Whether for pollens or for toxic dusts, masks will protect wearers only if they truly fit the face and have good skin contact all around the nose and mouth area. People with facial hair, very small faces, unusual facial shape, scars, or any other reason why the mask will not conform to the face will not be protected.

Remember that even after materials have been dried and superficially cleaned, you may have mold stains. Unfortunately there is very little that you can do about these, although a conservator may be able to lighten them. You should consult a professional conservator if an item needs further treatment after its condition has been stabilized. If you have questions about the information in this handout, or about treatment after its condition has been stabilized. If you have questions about the information in this handout, or about treatment of individual items, please call Northeast Document Conservation Center at (508) 470-1010 for further assistance.

Comments pertaining to health risks and respirator use were contributed by Monona Rossol, Arts, Crafts and Theater Safety, 181 Thompson St., #23, New York, NY 10012-2586.

MINNESOTA HISTORICAL SOCIETY

SALVAGE OF WATER DAMAGED COLLECTIONS

PAINTINGS ON CANVAS

Priority:	Begin drying within 48 hours to prevent mold growth.
Handling Precautions:	Move items only after a place has been prepared to receive them. If the frame is unstable, remove from painting, pad corners with corrugated cardboard, bubble wrap, or unused newsprint and transport to area dealing with wood objects.
Packing Method:	Pad corners of frame or painting with corrugated cardboard, bubble wrap, or newsprint. Transport paintings vertically; stand upright with corrugated cardboard between paintings so that painted surfaces do not touch another painted or any rough surface.
Preparation for drying:	Remove painting from frame.
Drying Procedure:	<p>Prepare a horizontal bed of blotter paper and unused newsprint, equal in thickness to the paint layer, with top most layer of strong clean tissue. Lay painting, still on stretcher/strainer, face down on this surface. Remove any remaining backing or labels from the painting, to expose wet canvas. Retain and tag all associated labels, parts and/or components that are removed or detached from the painting or frame.</p> <p>Place cut-to-fit blotters or unused newsprint against this back, and apply a slight amount of pressure so that the blotter makes good contact with the entire exposed canvas surface. Repeatedly change backing blotter, being careful not to create impressions in the canvas. DO NOT CHANGE FACING MATERIALS</p> <p>When dry to the touch, remove backing blotter and pick up painting.</p> <p>If front facing tissue is still attached to painting front, do not attempt to remove it, since it will hold the painting surface together until a conservator can consolidate it.</p> <p>Use fans to keep air moving in the room without blowing directly on the paintings. Use portable dehumidifiers to slowly remove moisture from the area/objects. Bring relative humidity down to 50%.</p>

MINNESOTA HISTORICAL SOCIETY

SALVAGE OF WATER DAMAGED COLLECTIONS

BLUEPRINTS

Priority:	Air dry or freeze within 48 hours.
Handling Precautions:	Do not separate single sheets but interleave the folders every two inches with freezer paper and pack. Place additional freezer paper on the top and bottom of the stack to prevent the wet folder from being in contact with the blueprints. (Caution - do not use acid-free buffered paper as alkaline solutions dissolve prussian blue pigment.)
Preparation For Drying:	Sponge standing water out of map drawers. Remove the drawers from the cabinet, ship and freeze them stacked up with 1 X 2" strips of wood between each drawer. Pack loose, large prints in bread trays, flat boxes, or on plywood covered with polyethylene. Bundle rolled maps very loosely to go boxed in small numbers to the freezer, unless sufficient freezer space is available for items to be unrolled.
Drying Methods:	<p>Vacuum freeze drying is best since it causes the least dimensional distortion. Freeze drying is the second choice and air drying third.</p> <p>Vacuum freeze drying and freeze drying will have to be performed by a vendor since it requires highly specialized equipment; see Appendix 2 for a list of vendors.</p> <p>Air Drying requires a space away from the disaster area which probably has high humidity. Lay material out on tables. Air must be continuously circulated as the material dries.</p> <p>See PAPER: uncoated for a more detailed description of drying methods.</p>

MINNESOTA HISTORICAL SOCIETY

SALVAGE OF WATER DAMAGED COLLECTIONS

WOOD

Priority:	Wet polychrome objects require immediate attention. Notify the objects conservator at once. Begin drying of all material within 48 hours to prevent mold growth.
Handling Precautions:	Move items only after a place has been prepared to receive them. Lift from the bottom of an object: tables from the apron; chairs by the seat rails, not by arms, splats, or crest rails; trunks from the bottom; etc.
Packing Method:	Partially wetted objects can be packed with dry blotting materials such as unused newsprint and acid free blotters to remove as much moisture as possible. Thoroughly wetted, unpainted objects should be wrapped with blotting materials, then wrapped in polyethylene sheeting to retain as much moisture as possible, since fast drying will cause irreversible damage.
Preparation for Drying:	Rinse or sponge with clear water to remove mud or dirt before drying. Be careful not to wipe or scour as grit will damage remaining finish. Use a soft bristle brush to clean carvings and crevices. If mud has dried, dampen lightly with a sponge and remove with a wood spatula.
Drying Procedure:	<p>Sponges, clean towels, paper towels, or unused newsprint may be used to absorb excess moisture.</p> <p>Air dry, using fans to keep air moving without blowing directly on the pieces. Raise items off the floor on trestles or 2x4 lumber to allow air to circulate underneath the items. Open doors and drawers to allow air to circulate inside the item.</p> <p>Use portable dehumidifiers to slowly remove moisture from the area/objects. Bring relative humidity down to 50-55%. Drying quickly will cause warping and cracking.</p>

MINNESOTA HISTORICAL SOCIETY

SALVAGE OF WATER DAMAGED COLLECTIONS

INORGANICS: CERAMICS, GLASS, METALS, STONE (Decorative/Historic)

Priority:	These materials can be dealt with last since they generally will suffer little damage from short term exposure to water.
Handling Precautions:	Move items only after a place has been prepared to receive them.
Packing Method:	Varies with the fragility of the material; water/wetness has no bearing.
Preparation for drying:	Rinse or sponge with clear water to remove mud or dirt before drying.
Drying Procedure:	<p>Sponges, clean towels, paper towels, or unused newsprint may be used to absorb excess moisture. Exchange wet for dry blotting material at least daily until items are dry. Check daily for mold growth.</p> <p>Air dry, using fans to keep air moving without blowing directly on the pieces. Raise items off the floor on trestles or 2x4 lumber to allow air to circulate underneath the items.</p> <p>Metal objects can be dried with moderate heat (90-100 F in an oven or using a heater or hair dryer. Use portable dehumidifiers to slowly remove moisture from the area/objects. Bring relative humidity down to 50%.</p>

MINNESOTA HISTORICAL SOCIETY

SALVAGE OF WATER DAMAGED COLLECTIONS

MAGNETIC MEDIA: COMPUTER DISKETTES

NOTE: THE TEXT OF THIS PAGE IS BEING REVISED

Priority:	Prolonged storage in water causes leaching of chemicals from the support. If a back-up copy is available, it is usually better to discard the water-soaked original.
Handling Precautions:	
Preparation for Drying:	Store diskettes upright without crowding, in cool distilled water until you are ready to attempt data recovery. Remove the disk from the jacket by cutting with non-magnetic scissors along the edge of the jacket. Carefully remove the diskette and agitate the exposed disks in multiple baths of cool distilled water to remove all visible dirt.
Drying Methods:	Dry with lint-free towels (cheese cloth). Insert disk into an empty jacket made by removing a new disk. You need only prepare one new jacket for each five to ten disks since the same jacket can be reused several times as you copy the material from the old disk to the new disk in the computer. Most diskettes can be salvaged unless the diskette itself is magnetically damaged or warped. The water damaged disk placed in the new jacket is inserted into a disk drive. Copy to a new disk and once verifying that the information has transferred, then discard the damaged disk.

MINNESOTA HISTORICAL SOCIETY

SALVAGE OF WATER DAMAGED COLLECTIONS

MICROFILM AND MOTION PICTURE FILM

Priority:	Rewash and dry within 72 hours.
Handling Precautions:	Do not move items until a place has been prepared to receive them and you have been instructed to do so. Do not remove from boxes; hold cartons together with rubber bands. Fill trays with water, and pack in a cardboard box lined with garbage bags or some other plastic container filled with water - the film must be kept wet until it can be reprocessed.
Drying Methods:	Arrange for MHS microfilm lab to rewash and dry film. The manufacturer or other professional processor should be contacted to rewash and dry motion picture film.

MINNESOTA HISTORICAL SOCIETY

SALVAGE OF WATER DAMAGED COLLECTIONS

MICROFICHE

Priority:	Freeze or dry within 72 hours
Handling Precautions:	Do not move items until a place has been prepared to receive them and you have been instructed to do so. If the fiche cannot be air dried immediately keep them wet inside a container lined with garbage bags until they be frozen.
Drying Methods:	<p>Freeze if arrangements cannot be made to air dry the fiche quickly. Fiche should be removed from the paper jackets to dry. Jackets should be retained to preserve any information printed on them, but this information should be transferred to new jackets once the fiche is dry and ready to be stored again. The best air drying method is to clip the fiche to clothes lines with rust-proof clips.</p> <p>Fiche has been successfully vacuum freeze dried, though freeze-drying of photographic materials is not widely recommended. If dealing with large quantities of fiche this option should be investigated.</p>

Emergency Salvage of Textiles and Clothing

FEDERATION FILES

A Publication Service of the Federation of Historical Services

Reprinted, in part, from

DISASTER PREVENTION, PREPAREDNESS AND RECOVERY

Special Concerns for Museum Textile Collections

By Kathy Francis, Chief Conservator

Textile Conservation Center

The purpose of these guidelines is to address disaster planning and recovery concerns that are specific to textile collections. Although general recommendations are included, the information is not intended as a complete guide to writing a disaster plan. Its aim is to focus on textile materials and to offer disaster planning and response information to be incorporated into a museum's general plan.

Many types of disasters including fires, floods, hurricanes, broken pipes and roof leaks -- involve water damage to buildings and collections. For this reason, and because textile materials respond so radically to wetting, the following plans for disaster preparedness and recovery focus on water damage. Although laboratory conservation treatment may be needed following a disaster, quick and careful emergency response will minimize damage to collections.

1. Types of Problems Encountered with Water-Damaged Textiles

Learning to identify the types of artifact damage you might encounter in an emergency is essential to arriving at emergency preparedness. In the event of an emergency, recognizing the diverse problems will also help you describe them more accurately if you are consulting a conservator by telephone.

The following represents a nightmare checklist for textile curators and conservators. However, consideration of the types and character of the damage should lead to appropriate emergency handling and salvage techniques which will minimize losses.

1. Heavy soils and plaster deposits, if ceilings or walls have collapsed onto collections
2. Slight to heavy soot deposits
3. Structural damage--tears, splits, fabric losses, etc.

4. Significant loss of strength--fabrics are weaker when wet
5. Loss of structural integrity--archaeological wool fabrics may become gelatinous when wet
6. Growth of mold and mildew
7. Dimensional instability, leading to physical distortion, stretching, shrinkage, differential shrinkage if a variety of materials are present
8. Damage to or loss of fabric finish (calendaring, glazing)
9. Loss of applied surface design--paint, gilding, etc.
10. Color bleeding and staining, within one item or between items
11. Movement of soils and degradation products causing staining within or between items
12. Contamination of artifacts by wet contact with non-archival packing materials (i.e., dirty and acidic cardboard, water soluble label markers, water soluble colored tissue papers)
13. Contamination by dirty water or sewage
14. Contamination and severe chemical reaction by contact with acidic or alkaline liquids (i.e. air conditioner fluids; these may dissolve some textile fibers)

2. Handling and Moving Wet Textiles

1. Wet textiles will be extremely fragile and must be handled and packaged with the utmost care. Because of the variety of materials and construction techniques involved, textiles will exhibit great differences in response to wetting. (Section 1 Identifies some types of damage.) A textile conservator should be on the disaster recovery team or should be available for telephone consultation regarding rare or unusual items.
2. Be sure that textiles are adequately supported for moving. Use boxes, trays and platforms as needed. If you find large items without storage boxes or tubes, two people can move them safely to the packing area using a length of sturdy canvas as a stretcher (much the same way that an injured person is moved with a litter).
3. Use interleaving fabrics or paper to prevent the transfer of soot and heavy soils from one area of a textile to another or between pieces. If dyes are bleeding, use freezer paper or wax paper to limit transfer of staining.
4. Don't handle anything unnecessarily. If boxes or rolls are intact check contents to log accession number and degree of wetness, but don't otherwise disturb the contents. If dyes are bleeding, transfer materials to a new box, isolating the problem pieces with freezer paper or wax paper.
5. Do not attempt to unfold extremely delicate fabrics that have been folded for the last century. Handling and packing should protect from crushing.
6. All boxes should be clearly marked and lists kept of the contents. Seek to use accession numbers, but if objects are unmarked, provide an emergency number and log a description.
7. Separate and label boxes according to degree of wetness (dry, damp, wet) and treatment (air dry, freeze, freeze-dry).

3. Air-Drying Wet Textiles

1. Air-drying may be considered if:

1. A small number of items are affected -- Air-drying textiles is labor intensive and may not be possible if a large quantity of material is wet. If disaster recovery team members are needed to move wet collections and prepare materials for freezing, this will usually take priority over drying operations.
2. Required materials are available--

These include:

- clean, flat drying surfaces (cover tables with polyethylene; wipe clean after each use)
 - large amounts of absorbent materials for blotting (cotton sheets, towels, blank newsprint)
 - adequate security
3. The environment can be controlled--The drying room should be clean. Temperature should be below 70 degrees Fahrenheit with relative humidity below 50 percent. Dehumidifiers and fans will be needed. Keep air moving but do not allow fans to blow directly onto artifacts.
 4. Expertise in care and handling is available--The techniques outlined assume some familiarity with textile structures, textile handling and packing techniques.

2. Technique for Air-Drying Small Flat Textiles

1. See Section 3.1. (Air-Drying may be considered if). Assemble materials.
2. Prepare clean, flat workspace by covering tables or floor with polyethylene sheeting.
3. Move one textile at a time to the drying space and position face up. Quickly assess the condition, looking for local weaknesses or structural damage. Assume that black and other dark colored silk embroidery is in poor condition and will powder with abrasion or pressure.
4. Place a single layer of cotton sheeting over the textile, with the sheet edges extending slightly beyond the textile. This sheet will remain in place until the textile is dry.
5. Place additional layers of absorbent fabric or blank newsprint on top of the sheet. Blot very gently, without disturbing the sheet. Allow the absorbent material to remain on the textile for several minutes to absorb maximum amount of water.
6. Carefully remove all paper and fabric without disturbing the single layer of sheeting (applied in step d). Repeat blotting for very wet items.

Maintain direct contact between the sheet and textile. Allow to air-dry completely before removing the sheeting.

3. Technique for Air-Drying Large Flat Textiles

1. See Section 3.1. (Air-Drying may be considered if). Assemble materials.
2. Prepare a clean, flat workspace by covering tables or floor with polyethylene sheeting.
3. Assemble a work team. Several pairs of hands will be needed.
4. Move a textile to the drying space and position face up. Quickly assess the condition, which may vary considerably throughout.
5. Cover the textile with a single layer of cotton sheeting, with the sheet edges extending beyond the textile. This sheet will remain in place until the textile is dry.
6. Apply towels or mattress pads over the sheeting to absorb the water. Blot gently and wait 5-10 minutes (or longer) so that the towels absorb the maximum amount of water.
7. Carefully remove the towels without disturbing the sheeting (applied in step e). Repeat blotting for very wet items. Allow to air-dry completely before removing the sheeting.

4. Technique for Air-Drying Garments

1. See Section 3.1. (Air-Drying may be considered if). Assemble materials.
2. Prepare a clean, flat workspace by covering tables or floor with polyethylene sheeting.
3. Cover an area larger than the size of the garment with cotton sheeting, towels or mattress pads.
4. Quickly assess the condition, looking for structural damage and handling concerns. Watch for severely weakened fabric in the armseyes due to perspiration damage. Be aware that women's garments may have boned bodies, metal stays, metal closures, and sharp items which could tear through extremely fragile wet fabrics.
5. Carefully lift garment onto the padded area. Wait 5-10 minutes (or even longer) so that the toweling absorbs the maximum amount of water. Do not blot unless the garment is very sturdy (wool coats, and military uniforms). Do not attempt to unfasten buttons or other closures.
6. If possible, place flat pieces of sheeting or blank newsprint (cut to small sizes) between front and back layers. Allow 5-10 minutes for newsprint to absorb water. Remove the paper, Repeat for very wet items.
7. Remove all blotting materials and allow to air-dry.

5. Technique For Air-Drying Tapestries

Please Note: Assemble a work team. This procedure will require 3-4 people.

1. See Section 3.1. (Air-Drying may be considered if:). Assemble materials — 10-12 cotton sheets and plenty of cotton towel will be needed.
2. Prepare a clean, flat workspace by covering tables or floor with polyethylene sheeting.
3. Unroll tapestry face down onto polyethylene. Quickly assess condition and determine warp direction, (traditionally, the warp runs from side to side). Prepare to roll the tapestry in the warp direction (usually side to side).
4. Starting at one side, cover the tapestry with cotton sheets. (This may be done in sections as the tapestry is rolled.) If the tapestry is extremely wet, add a layer of towels.
5. Using a large diameter (6+ inches), sturdy tube, begin rolling the tapestry, along with the sheets and towels. Attempt to roll straight but not too tightly. Roll to the place where your sheets end.
6. Cover the next section of tapestry with sheets (and towels if tapestry is extremely wet). Continue rolling. Repeat the process to the end of the tapestry.
7. Wait 5-10 minutes so that the sheets and towels absorb the maximum amount of water.
8. Unroll the tapestry, removing the sheets and towels as you go. Repeat blotting for very wet items. Check repeatedly to be sure that drying is progressing. Keep flat until completely dry.

6. Technique for Air-Drying Beadwork, Framed or Unframed

Minimize movement and keep fully supported. If framed, remove from frame. Lay flat onto absorbent cotton sheeting or blank newsprint to remove excess moisture by wicking action. Air-dry. Do not freeze.

7. Technique for Air-Drying Painted or Stencilled Fabrics

Lay flat with face up onto absorbent material to remove excess moisture by wicking action. Do not blot painted surface. Air-dry. Do not freeze.

4.

5. **Preparation of Textiles for Freezing and/or Drying**

Do Not Freeze Beadwork or Painted/Stencilled Fabrics.

See Section 3.6. (beadwork) and Section 3.7. (painted fabrics).

Small, Flat Textiles: Samplers, Embroidery, Towels, Small Loose Samples, etc.

Textiles should be kept flat. If time allows, gently blot extremely wet pieces with clean cotton sheeting blotter paper or blank newsprint. This is especially helpful if dyes are bleeding. Separate one textile from the next with freezer paper or wax paper to prevent staining between pieces. Box in small groups. Especially fragile pieces should be placed flat between two pieces of freezer paper. Provide rigid support by sandwiching between two pieces of cardboard. Freeze, then air-dry or freeze-dry after consulting a conservator. See instructions for air-drying.

Framed Needlework and Silk Pictures

Wet needlework should be carefully removed from frames. This may be extremely time consuming and will require some experience and workspace. Be sure to label frame, glass and needlework with accession number or temporary emergency number. If dyes are bleeding, blot gently, then pack textile flat between freezer paper and provide rigid support between two pieces of cardboard. Freeze, then air-dry or freeze-dry after consulting a textile conservator. See instructions for air-drying.

Single Layer, Large, Flat Fabrics--Bedcovers, Coverlets, Tablecovers, Curtains, Flags

Keep rolled pieces on storage tubes if possible. Move carefully--wet tubes can collapse causing structural damage to the textile. If needed, carry with a sturdy wood pole through the tube for added support. Protect from crushing damage by nesting the rolled piece within a larger sturdy tube. Freeze, then air-dry or freeze-dry after consulting a textile conservator. See instructions for air-drying.

Embroidered or Multi-Layered Flat Textiles: Curtains, Quilts, etc.

If possible, keep rolled or boxed as found in storage. Be careful of wet, weakened tubes as described above. Protect from crushing damage by nesting rolled pieces within larger sturdy tubes. If found without a container, prepare for boxed storage, interleaving with freezer paper if dyes are bleeding. Freeze, then air-dry or freeze-dry after consulting a textile conservator. See instructions for air-drying.

Fragile Garments (i.e. Silk Dresses)

Avoid handling garments if possible. Be aware that garments may have boned bodices, metal stays and metal closures which could tear through extremely fragile wet fabrics. Box to minimize crushing. Freeze, then air-dry or freeze-dry after consulting a textile conservator. See instructions for air-drying.

Sturdy Garments (i.e. Wool Uniforms)

If extremely wet, carefully blot with absorbent cotton sheet or blank newsprint to remove excess moisture. Freeze, then air-dry or freeze-dry after consulting a textile conservator. See instructions for air-drying.

Tapestries

Tapestries will be extremely heavy when wet. Tubes may be weakened and should be supported at center as well as ends. If possible, keep rolled on storage tube. Gentle blotting with absorbent cotton sheets or towels will reduce moisture in outer layers. See instructions for air-drying.

Sample Books

Treatment decisions will be complicated due to the variety of materials (paper, glue, leather, ink, fabric). Separate books with freezer paper and freeze. Air-dry or freeze-dry after consulting paper and textile conservators.

6. New Techniques, Resources and Further Study

Documented case studies of salvage techniques for textiles are limited. The author would greatly appreciate hearing from individuals who have worked on disaster response teams that have salvaged textiles. Experience with freezing and freeze-drying would be particularly useful for incorporation into later guidelines.

Kathy Francis joined the staff of the Textile Conservation Center at the Museum of American Textile History in 1979. Since then she has served as Conservation Technician, Assistant Conservator, and Associate Conservator, becoming Chief Conservator in 1988. Through her work with various museums and historical societies, Francis has developed a strong interest in a comprehensive approach to preservation.

As a regional agency, the Textile Conservation Center receives calls for recovery assistance as the result of roof leaks, burst pipes, air conditioning failures, etc. Through their on-site surveys, Francis and other Conservation Center staff stress the importance of disaster preparedness.

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The Federation of Historical Services (FHS) is a non-profit, regional agency which serves museums and historical organizations throughout the upper Hudson, Champlain and Mohawk Valleys in New York State, as well as western Massachusetts, Vermont and Connecticut. Its services include workshops, on-site and telephone technical assistance, and publications.

For additional copies of the leaflet, or for further information on the Federation and its programs, contact the Federation of Historical Services, 189 Second Street, Troy, NY 12180; (518) 273-3400.

HOTLINES

Federal Assistance

Those in need of Federal Assistance can call the following hotline: 1-800-462-9029 or 1-800-462-7585 for the hearing- and speech-impaired. The hotline is open from 8 AM to 6 PM CDT, 7 days a week until further notice.

Travel Information

Iowa Travelers Hotline: 1800-528-5265

Donations

Some organizations accepting donations to help victims of the Midwest floods:

American Red Cross Disaster Relief Fund
P.O. Box 37243
Washington, D.C. 20013
Credit card donations: 1-800-842-2200
Spanish-language: 1-800-257-7575

American Friends Service Committee
92 Piedmont Ave. NE
Atlanta, GA. 30303
404-586-0460

Disaster Relief Fund of B'nai B'rith
1640 Rhode Island Ave. NW
Washington, DC. 20036

Catholic Charities USA, Disaster Response
Midwest Flood Relief Processing Center
13331 Pennsylvania Ave.
Hagerstown, MD. 21742

Episcopal Church Center
Presiding Bishop's Fund for World Relief
815 Second Ave.
New York, NY. 10017

World Vision
P.O. Box 1131

Pasadena, CA. 91131

Credit card donations: 1-800-528-5265

LOCAL CONSERVATORS, CONSERVATION FACILITIES

AND OTHER CONSULTANTS

Don't just throw it out! Those precious items that were flooded may be salvagable. Here is a list of Conservators or Conservation Facilities willing to give advice over the phone about salvage of flood damaged materials. Some do offer conservation services for a fee.

Architecture/Historic Buildings

David Arbogast, 701 Eastmoor Dr. Iowa City, IA. 52246 319-351-4601

Books, Libraries, Paper Items

Ivan Hanthorn, Iowa State University Library Preservation Dept. 515-294-8858

Nancy E. Kraft, University of Iowa Libraries, Preservation Dept., 100 Main Library, Iowa City, IA 52240, 319-335-5286 nancy-e-kraft@uiowa.edu

Gary Frost, University of Iowa Libraries, Preservation Dept., 100 Main Library, Iowa City, IA 52240, 319-335-5908 gary-frost@uiowa.edu

Jane Meggers, State Historical Society Library, Iowa City 319-335-3921

Larry Yerkes, 1622 Muscatine Ave., Iowa City, IA. 52240 319-354-3091

Gerald R. Ford Conservation Center, 1326 South 32nd St., Omaha, NE 68105 402-595-1180 (voice) or 402-595-1178 (fax)

Objects

Pete Sixbey, State Historical Society of Iowa, 600 E. Locust, Des Moines, IA 50319, 515-281-4648 (voice), 515-282-0502 (fax), psixbey@max.state.ia.us

Gerald R. Ford Conservation Center, 1326 South 32nd St., Omaha, NE 68105 402-595-1180 (voice) or 402-595-1178 (fax)

Upper Midwest Regional Conservation Center, Minneapolis Institute of Arts, 2400 3rd Ave. South, Minneapolis, MN. 55404 612-870-3120 or 612-370-3004(fax)

Paintings

Upper Midwest Regional Conservation Center, Minneapolis Institute of Arts, 2400 3rd Ave. South, Minneapolis, MN. 55404 612-870-3120 or 612-370-3004 (fax)

Photographs

Upper Midwest Regional Conservation Center, Minneapolis Institute of Arts, 2400 3rd Ave. South, Minneapolis, MN. 55404 612-870-3120 or 612-370-3004(fax)

Art Institute of Chicago, Photographic Conservation Dept., 312-443-7252

Textiles

Debra Peek, 1808 Woodland Ave., Des Moines, IA 50309, leave a message at 515-243-7751

American Institute for Conservation offers a referral service for conservators in private practice and regional conservation centers. 202452-9545 or (fax) 202-452-9328.

COLD STORAGE FACILITIES IN IOWA

<p>Bettendorf 52722 Americold Corp. 6875 State Street Tel. (319)332-4300 Kenneth Gerdes</p>	<p>Burlington 52601 Burlington Ice & Cold Storage 1012 Agency Street Tel. (319)752-5455 Pres. J.R. Disselhorst</p>
<p>Cedar Rapids 52405 Hubbard Cold Storage (Division of Hubbard Ice & Fuel Co.) 1132 First St. NW Tel. (319)365-0500 Glenn T. Chadima</p>	<p>Cherokee 51012 Cloverleaf Cold Storage of Cherokee (Affiliated with Cloverleaf Cold Storage in Sioux City and LeMars) 1530 South Second Street Tel. (712) 225-5151 FAX (712) 225-5033 Pres. David M. Feiges</p>
<p>Denison 51442 Millard Refrigerated Services (Division of Millard Refrigerated Services, Corporate Office, Omaha, NE) 802 6th Avenue North Tel. (712) 263-6191 FAX (712) 263-5406 Larry Thompson</p>	<p>Des Moines 50303 Des Moines Cold Storage Co., Inc. General Offices 800 New York Street P.O. Box 781 Tel. (515)283-8050 FAX (515)283-8061 Pres. Edward C. (Chuck) Muelhaupt</p>
<p>Des Moines 50313 Millard Refrigerated Services (Division of Millard Refrigerated Services) 1650 East Madison Tel. (515)265-9861 FAX (515)265-7903 Al Harwick</p>	<p>Iowa City 52240 Millard Refrigerated Services (Division of Millard Refrigerated Services) 2710 Highway 6 East Tel. (319)351-2090 FAX (319) 351-7987 Larry Smith, Plant Mgr.</p>
<p>Le Mars 51031 Cloverleaf Cold Storage 18th & Lincoln Streets Sioux City Tel. (712)279-8000 FAX (712)279-8032 Pres. David J. Feiges</p>	<p>Marshalltown 50158 Marshalltown Cold Storage (Division of Des Moines Cold Storage) 816 Union Street Contact Des Moines Cold Storage at (515)283-8050 Pres. Edward C. (Chuck) Muelhaupt</p>
<p>Sioux City 51103 Cloverleaf Cold Storage Co.</p>	<p>Sioux City 51111 Millard Refrigerated Services</p>

<p>General Offices 223 Cloverleaf Court Tel. (712)279-8000 FAX (712)279-8032 Tim Gibbs</p>	<p>2640 Murray Street Tel. (712) 252-5755 FAX (712) 252-5778 Warehouse manager, Drew Walker Office manager, Marlene Colt</p>
<p>Spencer 51301 Quality Refrigerated Services (Division of Quality Refrigerated) 225 West 21st Street Tel. (712)262-1366 FAX (712)262-2913 Warehouse Pres. Timothy A. Jackes</p>	<p>Omaha, NE 68137 Millard Refrigerated Services Corporate Office 4715 South 132nd Street Tel. (402)896-6600 FAX (402)896-6700 Tom Dolfay</p>

PLEASE NOTE: Most commercial warehouse freezers review requests for freezing books and other materials on a case-by-case basis. Call ahead to inquire about availability and rates, before bringing your materials over.

NORTHEAST
DOCUMENT
CONSERVATION
CENTER

100 BRICKSTONE SQUARE
ANDOVER
MASSACHUSETTS
01810-1494

TEL 978-470-1010
FAX 978-475-4021
<http://www.nedcc.org>

Excerpt from **EMERGENCY MANAGEMENT SUPPLIERS,
SERVICES AND BIBLIOGRAPHY**

This list is not exhaustive, nor does it constitute an endorsement of the suppliers listed. We suggest that you obtain information from a number of vendors so that you can make comparisons of cost and assess the full range of available products.

American Freeze-Dry, Inc. 411 White Horse Pike Audubon, NJ 08106 (609)546-0777	Vacuum freeze drying
BMS-Catastrophe, Inc. 303 Arthur Street Fort Worth, TX 76107 (800)433-2940 (817)332-2770	Disaster recovery services, odor removal, vacuum freeze drying
Disaster Recovery Services 2425 Blue Smoke Ct., South. Ft. Worth, TX 76105 (800)856-3333 (817)535-6793	Full disaster recovery and planning services, vacuum freeze drying

<p>Document Reprocessors 5611 Water St. Middlesex, NY 14507 (888)437-9464 (716)554-4500</p>	<p>Vacuum freeze drying</p>
<p>Dorlen Products 6615 West Layton Ave. Milwaukee, WI 53220 (414)282-4840 (800)533-6392</p>	<p>Surface water detectors</p>
<p>Eastman Kodak Company Disaster Recovery Laboratory 1700 Dewey Ave. B-65, Door G, Room 340 Attn: Howard Schartz Rochester, NY 14650-1819 800-EKC-TEST (352-8378) (716)253-3907</p>	<p>Reprocesses original Kodak camera films free of charge</p>
<p>ESS (Electron System Services) 118 Parkwood Road Carbondale, IL 62901 (888)759-8758 or (618)529-4138</p>	<p>Computer data recovery service</p>
<p>Excalibur 101 Billerica Ave. 5 Billerica Park North Billerica, MA 01862-1256 (800)726-3669 or (978)663-1700 http://www.excaliburdr.com</p>	<p>Computer recovery service</p>
<p>Midwest Freeze-Dry, Lt. Midwest Center for Stabilization and conservation 7326 North Central Park Skokie, IL 60076 (847)679-4756</p>	<p>Vacuum freeze drying</p>

<p>Moisture Control Services 79 Monroe Rd. Amesbury, MA 01913 (508)388-4900</p>	<p>Disaster recovery services, building dehumidification, drying services, microfilm drying services</p>
<p>Munters Corporation - Moisture Control Services 79 Monroe Street Amesbury, MA 01913 Contact: Barry Kray (800)797-5020 or (978) 241-1100</p>	<p>Disaster recovery services, building dehumidification, drying services, microfilm drying services</p>
<p>National Fire Protection Association P.O. Box 9146 Batterymarch Park, PO Box 9101 Quincy, MA 02269-9101 (800)344-3555 or (617)770-3000</p>	<p>Fire prevention information and standards</p>
<p>Ontrack 6321 Bury Drive Eden Prairie, MN 55346 (800) 872-2599 or (612) 937-5161 http://www.ontrack.com</p>	<p>Emergency and on-site data recovery services</p>
<p>The Quality Rubber Co. P.O. Box 71 Sedalia, MO 65302-0071 (800)597-9947 (816)826-4641</p>	<p>Sponges for soot removal</p>
<p>Restoration Technologies, Inc. 1183 North Elsworth Ave. Villa Park, IL 60181 (800)421-9290</p>	<p>Disaster recovery of electronic equipment</p>
<p>Smolian Sound Studios 1 Wormans Mill Court Frederick, MD 21701 (301)694-5134</p>	<p>All types of audio tape restoration and acetate and shellac discs</p>

Contact: Steve Smolian	
Solex Environmental Systems P.O. Box 460242 Houston, TX 77056 (713)963-8600 (800)848-0484	Disaster recovery, dehumidification, building drying services
SPECS Brothers PO Box 5 Ridgefield Park, NJ 07660 852-7732 or (201) 440-6589 http://www.specsbros.com Contact: Peter Brothers	Recovery of videotapes and archival video tapes
Sterilizing Services Cumberland Industrial Park Cumberland, RI 02864 (800)556-6462	Ethylene oxide fumigation

REGIONAL FACILITIES

<p>AMIGOS Preservation Service Suite 500 12200 Park Central Drive Dallas, TX 75251 800/843-8482</p>	<p>Balboa Art Conservation Center P.O. Box 3755 San Diego, CA 92103-0240 619/236-9702</p>
<p>Center for Conservation & Technical Studies Harvard University 32 Quincy Street Cambridge, MA 02138 617/495-2392</p>	<p>Conservation Center for Art & Historic Artifacts 264 South 23rd Street Philadelphia, PA 19103 215/545 0613</p>
<p>Division for Historic Preservation - Collections Care Center Waterford, NY 12188 518/237-8090</p>	<p>Intermuseum Conservation Association Allen Art Building Oberlin, OH 44074 216/775-7331</p>
<p>Northeast Document Conservation Center 100 Brickstone Square Andover, MA 01810-1428 508/470-1010</p>	<p>Pacific Regional Conservation Center Bishop Museum Honolulu, HI 96817 808/847-3511</p>
<p>Rocky Mountain Conservation Center closed</p>	<p>Society for the Preservation of New England Antiquities--Conservation Center Lyman Estate 185 Lyman Street Waltham, MA 02154 617/891-1985</p>
<p>SOLINET--Southern Library Network Suite 200 1438 West Peachtree Street, NW Atlanta, GA 30309-2955 800/999-8558</p>	<p>Textile Conservation Center--Museum of American Textile History 800 Massachusetts Avenue North Andover, MA 01845 508/686-0191</p>
<p>Textile Conservation Workshop Main Street South Salem, NY 10590 914/763-5805</p>	<p>Upper Midwest Conservation Association 2400 Third Avenue South Minneapolis, MN 55404 612/870-3120</p>
<p>Williamstown Regional Art Conservation Laboratory</p>	

225 South Street
Williamstown, MA 01267
413/458-5741

Preservation Information on the Internet

"[Keeping Our Word](#)," virtual exhibit mounted in the University of Iowa's Main Library October '98 thru February '99

[Peter Verheyen's Preservation/Conservation Links](#)

[Northeast Document Conservation Center](#)

[A Simple Book Repair Manual](#) by Preservation Services, Dartmouth College Library.

[ALA's Disaster Preparedness Page](#)

[Library for Hazard Mitigation & Building Protection](#), National Building Protection Council

[Disaster Resources](#), University of Illinois at Urbana-Champaign

[Federal Emergency Management Agency](#)

[American Red Cross](#)

[Operation Fresh Start](#), an initiative designed to help individuals and communities incorporate sustainable principles and technologies into their plans when they recover from a flood, earthquake, or other disaster.

