

EMERGENCIES AND DISASTERS – RECOVERY PROCEDURES

DISASTER RECOVERY COMMITTEE (DRC)

In all emergencies that affect the condition of the library collections, notify the Disaster Recovery Coordinator immediately. If that person cannot be reached, call any member of the Disaster Recovery Committee, whose members have been trained in handling wet or otherwise damaged library materials, and have access to necessary supplies, equipment, and services. They are on call for any emergency, and will take charge of recovery operations as soon as they arrive on the scene.

The following describes recommended procedures and techniques used in such emergencies.

WATER DAMAGE

Wet paper is extremely fragile and may tear at a touch. Any wet material should be handled as little as possible.

Moist paper combined with warmth provides an ideal condition for the growth of mold. In order to prevent mold from developing it is absolutely essential to stabilize water-damaged materials within 48-72 hours. Weather is critical. When it is hot and humid 48 hours is the maximum safe period. When weather is cold a bit more time can be taken, but should not go beyond 72 hours. Mold will not grow without warmth and exposure to air. Damp books are even more susceptible to mold than wet ones.

All books, even those apparently dry, should be removed from the affected area and examined carefully. They should be stored in an area with good air circulation, air conditioning and with low humidity. All books should be thoroughly dry and be checked for mold before they are returned to their places.

As soon as area has been declared safe by the Fire Department, DPS Safety Officer, or Library administrator:

1. Secure the area, cordoning off the affected ranges in order to prevent possible injury to staff and patrons.
2. Stabilize Environment
 - In winter open windows and doors to lower temperature as much as possible but not below 32 degrees F. Have Physical Plant shut off heat if possible. Circulate air with fans.
 - In summer request Physical Plant to lower temperature as much as possible. Circulate air with fans.

- Try to lower humidity as rapidly as possible. Bring in de-humidifiers. Mop up water as soon as possible after source of water damage has been located and incoming water stopped.
3. Survey extent of damage. Make notes describing the scene, including number of ranges and approximate number of books affected, condition of the stacks (braced or leaning). This is a good time to photograph the scene if a camera and film are available.
 4. Formulate a plan of action and determine immediate supply needs and action priorities:
 - Delegate responsibilities
 - Appoint a person to meet and direct arrivals of off-site supplies and personnel
 - Appoint a person to secure the perimeter from sightseers
 - Set up a central communications post
 5. Make arrangements for equipment and supplies
 6. Make arrangements for additional staff to help in removing wet materials from area
 7. Retrieving materials
 - If there has been a fire, warn staff to watch for hot spots. Always feel something before opening. If hot, call a fire fighter.
 - Never retrieve items if it means endangering life or other material.
 - Establish a location for wrapping and packing wet materials into crates or boxes. Move tables into area to provide work surfaces. Cover tables with plastic.
 - Establish a human chain from the location of books to the wrapping and packing site. If distance is too far for human chain, establish book truck convoys to move materials (cover trucks with plastic).
 - A team member should be at the head of the chain. This team member should make rough priority and sorting decisions regarding treatment to follow:
 - a) Separate coated from non-coated materials.
 - b) Separate books that are so wet that they need interleaving from damp books that can be air-dried.
 - c) In a disaster involving hundreds of volumes the decision to freeze or air dry may best be made here, directing books to two separate processing chains.

- The salvage team leader should not become personally engaged in tasks, which do not permit movement from place to place.

8. Priorities for moving material from area.

- If area has previously established priorities, follow them.
- If books have fallen from shelves and are lying in water, retrieve these first. Water on floor should be removed as rapidly as possible to reduce humidity.
- Remove coated books before others.
- Remove any boxes of materials from floor.
- Remove wettest books next. This will also aid in reducing humidity.
- Soaked carpet should be removed promptly. If carpet lies under shelving ranges it must be cut.

9. Precautions

- Books that are to be frozen should be kept closed to minimize warping.
- Books with coated paper should not be allowed to dry out until they are interleaved or frozen. It is better to allow them to stay wet if they cannot be stabilized promptly.
- Do not empty cardboard boxes if they are very wet. Freeze as is.
- Always remember that reducing the cost of future restoration must be one of the top priorities of the salvage operation.

10. Washing muddy or dirty books. (This is rarely possible because of lack of time).

- No untrained person should ever be allowed to wash water-damaged materials.
- Never wash books if time is critical.
- Never UNDER ANY CIRCUMSTANCES wash material that contains water-soluble materials such as non-permanent ink, watercolors, tempura, etc.

FREEZING MATERIALS

1. Suggested priority for freezing

- a) Materials that have developed mold
- b) Leather and vellum bound volumes
- c) Manuscripts and art on paper stock
- d) Materials on coated stock
- e) Journals & monographs on non-coated stock

2. Purpose of Freezing

- Stabilization by freezing buys time. After freezing, decisions can be made about determining which items to replace rather than restore.
- Freezing stabilizes water-soluble materials, such as inks, dyes, etc.
- Freezing is not a drying method, nor will it kill mold spores, but it will keep spores dormant.

3. Packing materials for freezing

- If cardboard boxes are used, line with plastic or freezer paper.
- Wrap each book in freezer paper to prevent items from sticking together. Leave the tops and bottoms of books unwrapped to facilitate drying.
- Books should be wrapped and packed in the best shape and condition possible. However, if misshapen and warped item cannot be put into better shape without damage, wrap and freeze as is.
- Pack books SPINE DOWN, or on the side, never fore-edge down. Do not pack material too tightly.

Packaged material waiting transportation to freezers should be kept at 4 degrees F. or below in order to prevent mold growth.

4. Shipping Frozen Materials

- a) Load boxed material onto wooden pallets or skids if available for ease in transportation and to provide air spaces under boxes. Trucks should be backed up to loading dock.
- b) Load material in truck so that air can circulate between containers.
- c) Include instruction that materials should be frozen rapidly at the freezer facility to -20 degrees F. or below to create the smallest possible ice crystals.

5. Delayed Salvage

Unsafe Areas

If an area that has been declared unsafe to enter contains material that has been previously identified as being especially vulnerable to destruction, or is extremely valuable, it may be desirable to persuade the fire marshal or Physical Plant personnel to provide a SAFE means of access to remove these materials even though the area is still considered hazardous.

Mold

If access to an area has been delayed for several days, mold development may already have started. If there is a large amount of material it may be necessary to use fungicidal fogging. A professional fumigator should do fogging.

PROCEDURES FOR HANDLING SPECIAL MATERIALS

Photographs, Slides, Microforms

Do not freeze microfilm, microfiche, or color slides unless they cannot be dried professionally. If material has to be frozen it should be done as rapidly as possible.

Seal black and white negative film and prints in polyethylene bags and place in non-metal garbage cans under clean, cold running water until material can be shipped. Material can be left under these conditions for up to three days before the emulsion will separate from film backing.

Eastman Kodak Company provides emergency service for cleaning and drying: (716) 724-4000. [website address here](#)

Color slides and color negatives and positive film must be sent to Kodak within 48 hours. (Eastman Kodak, 343 State Street, Rochester, NY 14650)

Materials should be shipped to laboratory in cold water. For a trip of several hours it may be necessary to add ice (not dry ice) to keep it cold.

Framed photographs

Remove from frames at once so photographs will not stick to frames. Lay photos between blotters to dry.

Single sheets (Paper)

Do not attempt to separate single sheets. Normally frozen "as is" and separated later after vacuum or freeze-drying.

DO NOT ATTEMPT to sponge off mold.

Materials in drawers and boxes (including archival storage boxes).

Do not turn wet manuscript boxes upside down to empty, as the contents could stick to container and be torn.

If contents are thoroughly wet, freeze contents and containers as is.

If materials are damp and will not be damaged by handling, repack into dry boxes before freezing. If in doubt, freeze boxes as found.

Phonograph records

Remove discs from wet or damaged jackets. Always hold disks by their edges.

Wipe discs gently with a soft, lint-free cloth and place in a rack to dry in a low dust environment. If discs are heavily soiled, wash gently in clean water (room temperature or slightly cooler) without any soap added. Air dry. Do not use paper towels. Take care that labels are not lost or damaged.

Audio and Video Tapes

Rinse soil and mud off tapes. Dry within 48 hours if they include paper boxes and labels. Otherwise they can stay wet for several days.

Do not freeze.

Do not touch magnetic media with bare hands.

Handle open reels by hubs or reels

Air dry. Preservation copying may be necessary.

Keep all labels and identifying marks with the tapes.

Floppy disks

Avoid touching magnetic surfaces of diskettes.

Keep wet and pack immediately. Pack vertically in plastic crate or tub.

Air dry as soon as possible

Compact disks

Air-dry disks immediately. Do not scratch the surface.

If disks cannot be dried immediately, pack vertically in crates or cardboard cartons

Parchment or Vellum

Immediately air-dry, vacuum-dry, or freeze-dry

Moisture causes these materials to cockle. Seek advice of professional conservator regarding flattening.

DRYING MATERIALS

- Costs involved with drying and restoring materials are not always justified if material is in print and is replaceable. Decisions should be made at this point before drying.
- After drying, further decisions may be made whether replacement or restoration will be needed. Replacement if possible is nearly always cheaper than restoration.
- If the water damaged material was infected by mold before freezing, it should be sent to a commercial disaster recovery company to be sterilized by fogging with a fungicide.

Drying Techniques/Options

1) Freeze-drying and vacuum drying

Freeze-drying causes the water in materials to pass from the frozen to the vapor phase without going through the liquid phase. The moisture becomes volatile and mixes with air. Air is circulated to remove the moisture. Vacuum- drying generally is understood to mean that frozen liquid passes through a liquid state before it is removed by air absorption. Consult commercial disaster recovery companies.

2) Air-drying

The drying should be done in a large open workspace. There should be constant air circulation and dehumidification.

Temperatures should be maintained at 65-70 degrees F. (maximum) with a relative humidity of 35-45% (maximum). Frequent readings of temperature and humidity should be taken. Moisture content in the drying materials can also be measured.

Wet wrappings and blotting materials should be removed from the room as fast as possible in order to keep the humidity down.

If the books are contorted, they should be remolded into shape before drying. Wet materials should be separated into small units so that air will flow freely around them. The smaller piles will also prevent crushing of the materials on the bottom.

If the books are dirty, they should be cleaned.

Books can be weighed at the start of the drying process in order to determine the amount of water that has been absorbed.

Drain books by standing them on their heads (less strain on the spine) with their covers spread sufficiently to make them stand up. Styrofoam or foam rubber supports can be used to help the books stand. Their pages should not be fanned. Each book should stand on a piece of absorbent paper. These should be changed frequently and removed from the room.

When dried sufficiently to be opened without damage, the book may be interleaved with absorbent sheets.

When opening the books, take considerable care, keeping the opening shallow at first. Interleaving materials and absorbent papers under the books should be removed and changed often. After the interleaving has been changed a few times, the books will be almost dry. At this point they may be laid flat under moderate pressure to reduce cockling and warping.

If desired, partially dry books may be hung over nylon lines to finish drying. (They should not be hung when very wet because they will be damaged further). Hanging will help to restore the spine to its original shape. Spines tend to become concave due to the swelling of the leaves by water and the subsequent interleaving process.

NEVER STACK DRYING BOOKS

Books should not be returned immediately to the shelves. They should be shelved in a holding area with 35-45% humidity, separate from the stack area. This area should be well ventilated and air-conditioned, with a temperature not to exceed 65 degrees F. Temperature and humidity must be adjustable. There, the books can be inspected for further repair, rebinding, or restoration needs. Random inspection for mold infestation can also take place at this time. Newly - dried materials should never be packed in boxes unattended for more than a day or two. Books should remain in the holding area at least 6 months before returning them to the main stack area. During this time, temperature and humidity can be slowly changed to duplicate stack conditions. The books should be carefully inspected before their return to the stacks.

The shelves should be thoroughly washed with disinfectant, including the corners, bottoms, and sides of the shelves.

Do not move materials back until the shelves are completely dry and the temperature and humidity have been restored and maintained for several days. Then, the books may be re-shelved in the collections.

WASHING METHODS FOR MUDDY BOOKS

This method requires a large room with plumbing and adequate drainage.

- Install hoses feeding to bottoms of 6-8 (20 gallon) plastic garbage cans to:
 - a. Keep water running
 - b. Keep dirt overflowing out
- Keep books tightly closed (do not open books - they will fall apart)
- Gently sponge under water (daub - do not rub or brush - this will only drive dirt deeper!)
- Move books from can to can in successively cleaner water
- Spray with fine stream of water at end of procedure
- Press out water with hands (do not use mechanical presses)
- Dry or freeze

NOTE:

Do not attempt this method with open volumes, manuscripts, books printed on coated paper, art on paper, or photographs.

The washing of materials containing water-soluble components, such as inks, water-colors, tempera, dyes used in certain maps, and the like, should not be attempted under any circumstances. Seek the guidance of an expert.

FOLLOW-UP

A post-mortem should be held to determine what went right and what went wrong. Reports should be written and perhaps even published in order to help others learn from our mistakes. If the plan needs to be revised, this should be done. Supply sources and facilities should be evaluated and, if inadequate, new ones should be found. Used supplies should be replaced. Each person should be thanked for his/her part in the operation.

Site inspections should continue periodically for a year to be sure that no mold has begun to grow.