

**Disaster Plan**  
**Pennsylvania Highlands Community College**

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# **SECTION I**

## ***SALVAGE OF WATER DAMAGED MATERIALS***

### **1. Immediate Action**

Call the Dean of Learning Resources and/or members of the Disaster Response Team for assistance. Consult the “Emergency Procedures” list, which is posted, for telephone numbers.

Consult with the Maintenance Department, if possible, before proceeding with the following steps. The Maintenance Department number can be found on the “Emergency Procedures” list, which is posted.

#### 1.1 Eliminate the source of water.

Turn off the heat. If possible turn on the air conditioning and leave it on without interruption for at least 2-3 days. Turn on fans and dehumidifiers. The principal enemy to collections in a water disaster is mold, which can develop within 48 hours in a warm, damp environment. If conditions are more severe, it will establish itself in a shorter period. Mold growth will be discouraged if the environment is kept as cool and dry as possible with good air circulation.

The custodians should use wet-dry vacuums or carpet extractors to remove water on the floor or in carpets. Remove damp or wet curtains or rugs.

Be aware of potential electrical hazards. If the main power needs to be turned off, fans should be run from generators to avoid fire and danger to staff.

### **2. Damage Assessment and Intervention Priorities**

#### 2.1 General Considerations

In any flood, damage and loss are inevitable. Some materials will be permanently disfigured, whether cosmetically or structurally. The object of a salvage effort is to recover the collection as a whole, while minimizing damage. The Disaster Response Team should not spent too much time on single items or small groups of items at the expense of the collection.

#### 2.2 High Priority Items

If the disaster is widespread, or includes more than 4,000 items, immediately remove from the flood site high priority materials as identified in Section II “Collection Priorities.”

Remove materials that are highly valuable to water damage. Immediate attention should be given to photographic materials, such as collodian wet plate negatives, ambrotypes, panotypes, or tintypes.

Wet materials printed on coated paper (shiny), should be frozen before the paper dries and should not be allowed to dry. The surface layer of the adhesives and other substances on coated paper can cause adjacent pages to bond together when wet. When this effect, which is known as “blocking”, occurs it is virtually impossible to reverse. Pages will be permanently fused together and will be very difficult to separate. Vacuum freeze-drying is the most effective way to avoid blocking. See Appendix E for a list of vendors, which provide this service.

If mold has already developed, there is little likelihood that the material can be air dried, and it should be frozen immediately.

### 2.3 Assessing the wetness of the materials

Remove the most saturated materials first. They are not only likely to be the ones most in need of attention, but since they hold substantial quantities of water, their removal will help a great deal to lower the ambient humidity at the flood site. The upper most or lower most shelves will be the wettest, depending on the source of the water.

The following visual clues are good indicators of water content. The longer the books have been exposed to water, the more pronounced these indicators will become. The Dean of Learning Resources and members of the Disaster Response Team can provide advice in the assessment of wet materials.

- (1) Swelling of the textblock and binding
- (2) Deformation of the binding
- (3) Cockling of the paper or board
- (4) Darkening of the color of the paper, cloth, or leather.

Swelling is an especially good indicator of the length of exposure. The various parts of the book will swell at different rates as it continues to absorb water. The textblock will swell the most and push out against the less expensive case and the sewing thread, which may even shrink. This results in a tendency for the spine to assume a concave configuration; the longer the book sits, the more concave it becomes. When sitting in a pool of water for a few days, some books swell to such an extent that the spine forms a tight backwards circle and the front board touches the rear board. Some tightly shelved books may swell to such a degree that they “walk” themselves off the shelves. Swelling will usually reach its peak after a few days.

## 2.4 Freezing

Detailed instructions for this procedure are provided in Appendix A.

When over 100+ items are damaged it is generally not practical to air dry these materials on-site. If this is the situation, the materials should be frozen as quickly and safely as possible. Proper freezing at very low temperatures will stabilize materials physically and chemically by preventing the development of mold; the further swelling of the paper and boards; the bleeding of inks; and possibly the blocking of pages. Most importantly, freezing buys time, which allows one to plan the salvage efforts sensibly, without having to operate under crisis conditions. Books and papers can be frozen indefinitely without damage.

## 3. Recovery Procedures for Books

### 3.1 Handling Procedures

Wet paper has very little strength and easily tears. Do not attempt to open a very wet book. The pages of a wet book cling together and an attempt to open it may result in serious tears. Moreover, damage to the binding can occur. If the book is only damp, it is usually safe to open, though this is not necessary unless it is to be air dried.

Do not attempt to close a wet book that has been found lying open, as often happens when books walk off the shelves and fall into standing water. Such books are usually badly swollen and the pages may be temporarily fused together.

### 3.2 Mud, Silt, and Dirt

Generally it is not a good idea to attempt to remove mud or other debris at the flood site, but rather to allow them to dry and brush them off later. However, if the materials are extremely dirty or the contaminants are particularly noxious or toxic, it may be necessary to wash off the covers of the book before further treatment. This is best accomplished by holding the book closed and exposing the spine to a slow stream of water, with the fore edge pointed down so that the water runs off the case without further wetting the paper. On occasion it may be necessary to wash contaminants from the paper itself, in which case extreme care should be taken. This task should be performed as quickly as possible. Books that have been washed should be frozen immediately. Rare materials, art on paper and other unique items may need to be treated in a different manner. Please contact the Dean of Learning Resources for assistance with washing and advice on other methods for removing debris.

### 3.3 Disbinding

In a small scale emergency when attention can be paid to individual items, it is on occasion, appropriate to remove the textblock from its case. This may be appropriate

when the textblock is swelling severely and is being distorted by the case, or when mold has begun to grow in the case. Please contact the Dean of Learning Resources for assistance if you think that this needs to be done.

### 3.4 Drying Methods

If you need time to make decisions or remove large numbers of materials from the disaster site, books and documents should be frozen to reduce physical distortion and biological contamination. (See Appendix A for instructions.)

Four methods for drying materials are summarized below. Detailed instructions are provided in the appropriate appendixes at the back of this manual. Although vacuum thermal drying is an acceptable method for drying documents, it causes extreme distortion in the books; coated papers almost always block with this procedure. Since other more effective methods are readily available, this process was not included. Please contact the Dean of Learning Resources for more information.

#### 3.4.1 Air Drying (See Appendix B for instructions)

Air drying is a very time consuming, labor intensive operation, which is most suitable for small numbers (less than 100) of damp or slightly wet books or documents. It is seldom successful for drying coated (shiny) paper, such as the sort of paper found in many art books or journals.

#### 3.4.2 Dehumidification (See Appendix E for vendors)

Dehumidification is the newest method used to dry library materials and is appropriate for drying damp to moderately wet books, documents, equipment, and furnishings. Dehumidification must be initiated within 24 hours before swelling and mold develops. It should not be used for drying coated (shiny) paper. Large commercial dehumidifiers are brought into the library with all the collection, equipment, and furnishing left in place. Temperature and humidity can be controlled to the customer's specification. The advantage of this method is that materials can be dried in place on the shelf or in storage boxes. The time and expense of removing materials to a freezer or vacuum chamber are eliminated.

#### 3.4.3 Freezer Drying (See Appendix E for vendors and Appendix G for location of nearest freezer.)

This method is most successful with books and documents that are damp or moderately wet. It is important to freeze materials as quickly as possible to reduce distortion and facilitate drying. Until the items are frozen through to the center, the freezer should be -1- degrees F. or lower to encourage the formation of the smallest ice crystals. After this state has been achieved, the freezer temperature can be raised to around 0 degrees F. so that some drying can occur. Home freezers are usually not cold enough to achieve rapid freezing but may be used at the lowest possible temperature

setting, if more suitable equipment is not available. Frost-free units are preferred since they will begin to dry the materials, albeit slowly.

Materials should be placed in the freezer as soon as possible after water damage has occurred. Books will dry best if their bindings are supported firmly to inhibit swelling. Manuscripts or unbound materials may be placed in the freezer in stacks or spread out for faster drying. In very large commercial freezers these materials may be left in their storage boxes, however, this will slow the drying process. Depending on the freezer temperature and the extent of the water damage, this method will take from several weeks to several months to dry the materials.

#### 3.4.4 Vacuum Freeze Drying (See Appendix E for vendors.)

Vacuum freeze drying is a commercial application of a physical phenomenon called “sublimation”. Frozen materials are placed in a vacuum chamber. The collections are dried at temperature below 32 degrees F. through a process called sublimation, in which ice crystals vaporize without melting.

This process is very effective in drying large quantities of wet books and paper records. Vacuum freeze drying will not cause additional distortion or swelling beyond that incurred before the materials were placed in the chamber. Coated books will dry well if it has been frozen or placed into the chamber within 6-8 hours. Rare and unique materials can also be dried successfully with this method, but leather and vellum bindings may become distorted. It is also effective with water soluble inks and pigments. Vacuum freeze drying also lifts mud, dirt and soot to the surface, making cleaning less time consuming.

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 or recasing are often not necessary.

## **4. Recovery of Non-Paper Media**

### 4.1 Computer Media

Prevention is the best insurance against loss. Make backups and store off-site. Equipment may be damaged trying to copy contaminated tapes or disks. Contact the supplier before proceeding with the instructions below, if possible. See Appendices D and E for consultant and vendors that specializes in salvaging computer media.

### 4.2 Microforms

Consult with manufacturer. See Appendices D and E for a list of consultants and vendors that specialize in salvaging microforms.

Diazo Fiche

Priority: Last

Handling:

Packing: In drawers or cartons

Drying: Air Dry

Jacketed Microfilm

Priority: Freeze or dry within 72 hours.

Handling:

Packing: Keep wet inside a container lined with garbage bags until drying can begin.

Drying: Air dry

Microfilm Rolls:

Priority: Rewash and dry within 72 hours

Handling: Do not remove from boxes; hold cartons together with rubber bands.

Packing: Fill boxes with water and pack (in blocks of 5) in a cardboard box lined with garbage bags.

Drying: Arrange for a microfilm processor to rewash and dry within 72 hours; label box "Wet Film."

#### 4.3 Sound and Video Recordings

See Appendices D and E for a list of consultants and vendors specializing in the salvages of sound and video recordings.

### **5. Procedures for Shipping Materials to Vendors or Conservators for Salvage or Restoration**

Contact the vendor or conservator for information on cost, shipping, and turnaround time. When contracting for drying procedures, such as vacuum freeze drying, it is good to know if the materials will be dried in the boxes they were shipped in. In the case of manuscript or archival materials it may be important to retain the order of the documents. Will the vendor ship the materials back in the same boxes they were delivered in? If not, will they relabel boxes if this was done to keep track of their contents? Turn around time? What sort of materials can't be salvaged need to be sent? Other questions?

The Business Manager should be consulted before contracting with a conservator.



## SECTION II

### Collection Priorities

The following collections/items should be protected, removed, or salvaged in the event of a major collection related emergency. These locations are identified on a map of the library at the end of this appendix.

Collection/Item	Location
Reference	Main Room
DVD's	Behind Circ Desk
Software	Workroom

## **SECTION III**

### Preventative and Protective Measures

This section should describe activities taken to prevent or minimize damage to the collections. These include assessing the library's vulnerability to disasters and taking steps to prevent or reduce the impact of disasters. A "Disaster Prevention Checklist" should be developed to survey the library.

## **APPENDIX A**

### PACKING WET MATERIALS FOR FREEZING OR TRANSFER OFF-SITE

1. Contact the Dean of Learning Resources or member of the Disaster Response Team for assistance with this procedure.
2. Standard size record or book boxes (12" x 15" x 10" or 1 cu. ft.) are suitable for packing most materials. It is important that boxes be the same size for moving and cost estimates. Consult Appendix F for the location of boxes in the library or suppliers for obtaining them. When using metal or plastic milk crates place cardboard between the container and the contents to avoid transfer of the container's design.
3. Wrap each volume in wax or freezer paper to prevent sticking. (Rough cut wax or freezer paper to approximate size and fold in a U-shape around the case.)
4. Pack books in a single row with the spine down. If this is not possible, pack them flat. In this case, it is important that a large book never be placed on top of a smaller one, because the large one will sag and become permanently distorted. Never pack books in a standing position or with fore edge down because the weight of the wet paper will pull the textblock out of its case.
5. Books will tend to permanently take on their shape at time of freezing. Please do not attempt to mold misshapen books without consulting a member of the Disaster Response Team or the Dean of Learning Resources. Excessive attempts to bend or bold the book may cause damage and result in a volume that is difficult to repair.
6. Keep an inventory of the contents of each box. Label boxes with call number ranges.
7. Stack boxes on pallets, no more than three cartons high to avoid collapse of boxes. Milk crates can be stacked higher than boxes. However, since wet books are very heavy even milk crates should not be stacked more than three feet high.
8. Code boxes to identify location of materials requiring special treatments.

9. Books that have been swollen open should not be closed. Instead they should be packed in their own carton. Similarly, books that have struck together should not be separated, but wrapped as a unit and packed together.

10. The locations of available freezer space in the institution are listed in Appendix G. This appendix also lists freezer companies in the area. For a list of conservators and vendors specializing in recovery of damaged materials see Appendices D and E.

## **APPENDIX B**

### **PROCEDURES FOR AIR DRYING WET BOOKS.**

Air drying is most suitable for small numbers of books that are damp or water damaged only around the edges. It is a very labor intensive process that can result in extra expenses for rebinding. Consider alternative methods outlined in 3.1.4 of the “Salvage of Water Materials” section if there are more than 100 books to dry; if the books are extremely wet; or if the books are printed on coated (shiny) paper.

Once the books are wet they will develop mold and can suffer structural distortion within 24-48 hours, so it is important to move quickly. The longer the drying period, the greater the distortion. It is also important to remember that wet paper is very fragile and easily torn.

#### Equipment

Long tables or flat surfaces for drying.

Unprinted paper towels (for interweaving)

Towels or blotting paper (to line tables and remove water that drains from the materials)

Fans and extension cords

#### Procedure

1. Secure a clean, dry environment where the temperature and humidity are as low as possible. Ideally, the temperature should be below 70 degrees F. and the relative humidity below 50% to prevent mold growth and distortion.
2. Line the tables with towels or blotting paper to absorb water dripping from the books.
3. Stand books up on flat surface and fan open slightly. Interleave volumes with paper towels every 20 leaves or so. A sheet should be placed between the cover and textblock at front and back. The paper should not be placed all the way into the fold because the buildup at the spine may cause damage to the binding. The interleaving should extend

past the edges of the book at the head (if the book is set on its tail) and fore edge, but not at the tail. Do not attempt to open pages that are stuck together.

4. Place fans in such a way that they keep the air moving gently over all of the volumes without blowing them over. Sometimes this can be best accomplished by using large, powerful fans and placing them at a considerable distance from the books. The fans must be left on around the clock until the drying is complete.

5. As the interleaving papers become saturated with water, replace them with fresh paper. The new towels should be inserted in different locations throughout the volumes. Turn the book upside down when replacing the interleaving. When the books are very wet, the interleaving will become saturated almost immediately and as soon as you finish interleaving a small group of books, it will be time to start all over again. When interleaving papers cease to be wet and but are merely damp, it is no longer necessary to replace the interleaving. Unless the newsprint is stained it can be reused once it has dried.

6. Books with coated paper should be interleaved between every page to avoid blocking.

7. When the pages feel dry in the center of the volume, remove all the interleaving. It may take a couple of days for the very wet books to reach this condition. Allow the book to continue to air-drying with fans for several days until completely dry. Paper can hold substantial quantities of water and still feel dry to the touch.

8. After drying, bound volumes should be flattened by placing them in a press or under heavy weight.

9. Please contact the Dean of Learning Resources for advise on books with damaged covers or distorted textblock. The Dean of Learning Resources may be able to repair these in-house or they may be sent to the commercial bindery.

## **APPENDIX C**

### **PROCEDURES FOR AIR DRYING MANUSCRIPTS AND UNBOUND MATERIALS**

Flat materials, such as manuscripts, typescripts, prints, drawings, blueprints, etc. exhibit somewhat wider variability of materials and production methods than printed books. As a result, problems with soluble media (bleeding inks, etc.) and blocking of paper are common. Inks may dissolve and offset onto adjacent materials. Such staining will frequently be permanent and irreversible.

Air drying is most suitable for small numbers of unbound materials, which are damp or water damaged only around the edges. If there are hundreds of single pages; the paper is coated; inks are soluble; or the water damage is severe, other methods of drying would probably produce better results and be more cost effective.

Wet paper is extremely fragile and easily torn or damaged, so care must be exercised. It is also important to remember that this process will not restore materials to their original condition. Contact the Dean of Learning Resources for assistance in performing this procedure, as it can cause a great deal of damage if not done correctly.

## **APPENDIX D**

### **PRESERVATION EXPERTS AND CONSERVATION CENTERS**

The following is a list of individuals and institutions that specialize in salvaging, restoring, and reformatting damaged library materials.

Nancy Ash  
63 Lodges Lane  
Bala Cynwyd, PA 19004  
**Salvage and restoration of books and paper**

Guild of Book Workers, Inc  
521 Fifth Ave  
New York, NY 10175  
**Professional organization of book conservators**

Library of Congress  
National Preservation Program Office  
LM-G07  
Washington, D.C. 25040  
**Information on salvage, restoration, and reformatting of books and paper**

National Archives and Records Administration  
Conservation Lab  
NNPD Room B-1  
Washington, D.C. 20408  
**Information on salvage, restoration and reformatting of archival materials**

National Center for Film and Video Preservation  
2021 North Western Ave  
Los Angeles, CA 90027  
**Information on salvage, restoration and reformatting of film and video**

Northeast Document Conservation Center  
100 Brickstone Square  
Andover, MA 01810-1428  
**Regional conservation center which specializes in the salvage, restoration, and reformatting of books, paper materials, and photographs**

## APPENDIX E

### DISASTER RECOVERY SERVICES

Except as noted, these companies can provide comprehensive recovery services and a great deal of advice in the event of a disaster. Most can be reached by phone 24 hours a day.

American Freeze Dry, Inc.  
411 White House Pike  
Audubon, N.J. 08106

**Vacuum Freeze Drying; -20 deg. F. storage.** This company deals primarily with **books and paper**. They can provide milk crates, pick-up and delivery, cleaning of materials, **smoke and odor removal**.

Graham Magnetics, Inc.  
4001 Airport Freeway  
Suite 400  
Bedford, TX 76021

**Washing and drying of computer media**

Munters Moisture Control Services  
15 Freeport St  
Delmont, PA 15626

**Water pumping and vacuuming; drying of floors, walls, insulation, and furnishings.**  
**Cost estimates are provided after an evaluation of the damage.**

Backstage Library Works  
9 South Commerce Way  
Bethlehem, PA 18017

**Washing and duplicating of 16mm, 35mm and 105mm silver roll microfilm**

Smolian Sound Studios  
26801 Haines Rd  
Clarksburgh, MD 20871

**Restoration and preservation of most audio media**

## APPENDIX F

### DISASTER SUPPLIES AND EQUIPMENT INVENTORY

This inventory should be completed by the library and revised when needed or once a year. The Dean of Learning Resources will assume responsibility for maintaining this list for the library. The Dean of Learning Resources should be notified if essential supplies need to be reordered. Items **highlighted** are essential.

Item: **Boxes** (or milk crates)- for packing wet materials for freezing

Location:

Quantity:

Supplier: U-Haul for boxes, Galliker's for milk crates

Item: **Book Trucks**

Location: Available in the library

Quantity: 1

Supplier:

Item: Camera and Film

Location:

Quantity:

Supplier:

Item: Disinfectant -to wipe shelves to stop mold growth

Location: Maintenance Dept.

Quantity:

Supplier:

Item: Dolly

Location: Maintenance Dept.

Quantity:

Supplier:

Item: **Extension Cord**

Location: Library

Quantity: 2

Supplier:

Item: **Fans** (large, rotating)

Location: Library

Quantity: 1

Supplier:

Item: Flashlight  
Location: Maintenance Dept.  
Quantity:  
Supplier:

Item: Gloves (plastic disposable or rubber)  
Location: Maintenance Dept.  
Quantity:  
Supplier:

Item: **Knives** (Utility or Zippy)-for cutting plastic sheeting  
Location: Library  
Quantity: 2  
Supplier:

Item: **Masks** NIOSH approved Respirator for Toxic Dust-use when working with mold  
Location:  
Quantity:  
Supplier:

Item: **Mops and Buckets**  
Location: Maintenance Dept.  
Quantity:  
Supplier:

Item: **Paper Towels** (unprinted, white)- for air drying books.  
Location: Library  
Quantity:  
Supplier: Walmart

Item: **Plastic Sheeting** -to cover stacks, computers, etc.  
Location: Library under stairs storage area  
Quantity: 1 roll of 4 mm polyurethane  
Supplier:

Item: **Tape** -for sealing boxes or securing polyethylene sheeting for book shelves  
Location: Library workroom  
Quantity:  
Supplier:

Item: **Waterproof Pens** -for marking contents of boxes  
Location:  
Quantity: 2 pens  
Supplier: Premiere

Item: **Waxed Paper** or Freezer Wrap- to separate wet books for freezing



Location:  
Quantity:  
Supplier: grocery store

## **APPENDIX G**

### **EQUIPMENT TO BORROW OR RENT**

The equipment listed below is available locally.

Item: Freezer Locations

Vendor:

Location: Cafeteria Kitchen

Cost: na

Item: Freezer Space

Vendor: Galliker's, Von's United Beverage

Address:

Other:

Cost:

Item: Freezer Trucks

Vendor: Galliker's

Address:

Tel #:

Other:

Cost:

Item: Hygrothermograph

Owner: National Park Service-Allegheny Portage Railroad NHS

Address:

Tel.#:814-886-6100

Cost: no charge