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# **Western New York Disaster Preparedness and Recovery Manual for Libraries and Archives**

**Third Edition 2003**



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The purpose of the *Western New York Disaster Preparedness and Recovery Manual for Libraries and Archives* is to encourage the development of individual disaster plans in archives and libraries. The WNYLRC Preservation Committee encourages reproduction of the original document in whole or in part, either photomechanically or electronically, as needed to complete local plans. If reproduced in part the Committee requests that the following attribution be included: *Excerpted [adapted] from the Western New York Disaster Preparedness and Recovery Manual for Libraries and Archives, Third edition 2003.*

The first edition of this Manual was developed with funding from the 1990/1991 Conservation/Preservation Discretionary Grant Program, New York State Library, Division of Library Development.

Printing of the third edition, 2003, was generously provided by Bureau Veritas Consumer Product Services, Inc.



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# ACKNOWLEDGMENTS

The first edition of the *Western New York Disaster Preparedness and Recovery Manual for Libraries and Archives, 1992*, was made possible by a grant awarded by the New York State Library as part of its 1990 New York State Conservation/Preservation Discretionary Grant Program. The *Manual* was compiled by the Regional Disaster Preparedness Subcommittee of the Conservation Committee of the Western New York Library Resources Council (WNYLRC), chaired by Franciska Safran. The project was supported by WNYLRC, as represented on the Subcommittee by John Shaloiko, former WNYLRC assistant director. Barbara Rhodes, conservator, American Museum of Natural History, served as technical consultant.

At the urging of Peter Jermann, Chairperson of the WNYLRC Preservation Committee, the Regional Disaster Preparedness Manual Update Subcommittee, chaired by Kari Horowicz, revised and updated the manual, compiling the revised edition, 1994. Credit is due to the Subcommittee members for their time in working on the revised edition, and to Mike Fornasiero, Documentary Heritage Program Assistant, WNYLRC, who input and formatted the new suppliers section. Donna Serafin, Preservation Officer, State University of New York at Buffalo, and Dorothy Tao, Information Specialist at the Information Service of the National Center for Earthquake Engineering Research, State University of New York at Buffalo edited and formatted the first and revised editions of the manual.

Since the *Western New York Disaster Preparedness and Recovery Manual for Libraries and Archives* hadn't been updated for eight years, Barbara Vaughan, Chairperson of the WNYLRC Preservation Committee 2001-2002, advised that it was due for a facelift. A new subcommittee was formed consisting of Andrew Dutcher, Chair, Brenda Battleson, and Barb Vaughan. When Andrew left the committee, Barb assumed the duties of the Chair and continued to work on the manual even after her term on the Preservation Committee expired. With extensive revisions and updates, the subcommittee compiled this 2003 edition. Brenda Battleson is to be highly commended for the research and significant rewriting of the text in numerous sections, as well as reformatting the entire manual. Also contributing to this project, was Stacy McGirr, student assistant at Butler Library, Buffalo State College, who spent many hours re-formatting the Suppliers Directory, inputting revisions, editing several sections, and proofreading. She provided constructive criticism as well, and many of her excellent suggestions were incorporated into the manual.

Special thanks are due to Karen Kreizman Reczek and Rachele Petrella of Bureau Veritas Consumer Product Services, Inc., who took on the task of printing this third edition of the *Western New York Disaster Preparedness and Recovery Manual for Libraries and Archives*. It is certain that without this gracious offer, the printing of this updated edition would not have been possible.

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# INTRODUCTION

## PURPOSE AND SCOPE OF THE MANUAL

The *Western New York Disaster Preparedness and Recovery Manual for Libraries and Archives* is a two-part sourcebook comprised of a worksheet section and reference section. While intended for all types of institutions within the region served by the Western New York Library Resources Council, this manual may especially benefit those institutions which lack staff expertise to develop their own disaster plans. The worksheet section consists of various forms to be completed with local information specific to each institution or library. The reference section is comprised of basic information concerning disaster planning and preparedness, as well as emergency response and recovery procedures. *This manual does not constitute a disaster plan in itself, but rather provides a framework for individual institutions to construct their own plans for the protection and salvage of their collections.*

The **primary purpose** of this manual is to provide information for response to a disaster with some emphasis on the preventative measures or steps that can be taken by individual institutions to minimize the risk of such situations. Because the elements that most often threaten libraries and archives are fire and water, the emphasis of this manual is on preparation for and response to situations that involve these particular elements.

### *Regarding the Threats From Terrorism*

In this post “September 11<sup>th</sup>” world, threats from terrorism—mechanical, chemical and biological—are all too real and must be considered and addressed in every institution, especially those where the culture and history and intellectual endeavors of a society are collected and preserved. (These are often targets of such acts of violence.) It must be emphasized, however, that this manual does not address the threats from terrorism *per se*, for this is far beyond the expertise of the authors or, realistically, the capabilities of any one library, museum or archive.

The prevention of and response to acts of terrorism, such as bomb threats or the potentially malevolent release of biological or chemical agents, must be addressed at the larger institutional level and not at that of any single library or archive. Specialized response to such incidents is necessary and as such, the involvement of parent institutions like universities, schools, corporations and/or municipalities in which the library or archives exists is imperative.

Librarians, archivists and their staff are not hazardous materials specialists or biological agent experts and aside from having the safety of people in mind and an evacuation plan in place, immediate response to any terrorist act cannot and should not fall upon them. However, they do have a role, should a terrorist-related incident occur. The damage occurring in such events is usually a result of fire and/or water, both of which are addressed in this manual. Thus, once the

initial response specialists and subsequent investigative agencies approve, the needs of any salvageable collections may be addressed. This, of course, would be part of a larger institutionally-driven response plan.

### *People vs. Collections*

This brings us to the discussion of another factor in disaster planning that is not directly covered in this manual – procedures regarding human safety. This manual is designed to be a *response* to a particular disaster, with *emphasis on recovery and rehabilitation of collections*. However, the need for having procedures in place to address human safety should be of the *highest priority* in any disaster plan. Such procedures and policies must take into account the size and physical infrastructure of individual repositories, local building and fire codes, the number of staff and patrons in the building at any given time, evacuation procedures for the disabled, as well as any procedural requirements of the parent institution or municipality of which the library or archive is part. In other words, it is much more than a simple case of response and is as such, beyond the scope of this manual.

The authors of this edition of the *Western New York Disaster Preparedness and Recovery Manual for Libraries and Archives* advocate the development of a specialized prevention and response manual to address personal safety issues. This could exist as a stand-alone publication or as a second volume to this manual. Here could also be addressed the potential threats from terrorism as well as a guide for implementing procedures and policies directed at preventing and responding to threats to the repository's "human element." Such procedures should be part of any library's formal disaster plan. However, given the complexities and requirements of local ordinances and laws, as well as the emphasis on human safety above all else, these policies should be specific to the individual library or archive, but also derived from larger, institutionally- or municipality-driven plans already in place.

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# HOW TO USE THE MANUAL

## The Manual

This manual is divided into two parts. The first part contains 21 worksheets which are the skeleton of a disaster plan. Part Two is a reference section containing background information, instructions on salvage techniques, a selective bibliography and list of online meta-sources, a list of national sources for specialized supplies and services as well as a guide for finding local suppliers. Users of this manual are advised to read through the reference section before filling out the worksheets. The worksheets are designed to organize and provide ready access to the information most needed for disaster preparedness, response, and rehabilitation. They are arranged in order of "urgency," with those lists placed in the front comprising contact lists and other information likely to be needed immediately in the event of an emergency.

Users may, of course, customize the order of the worksheets to meet the needs of their respective institutions and thus, alter the table of contents to reflect any revised order. Not every form will be appropriate to the needs of every institution. (For example, one cannot list the locations of sprinklers if they are not present.) For the sake of efficiency, worksheets which are not used may be removed and placed at the back of the manual or discarded. This is, of course, the decision of the individual institution. Additionally, institutions with large collections and, presumably, a more complex staffing structure may wish to assign higher priority to those worksheets dealing with personnel and collections.

Although the worksheets will help to organize emergency information, they will not be useful unless a good deal of thought and planning goes into completing them. Difficult decisions will have to be made, particularly when it comes to assigning priorities for protection and salvage of collection materials. The process of gathering information for this manual may help to identify problems in safety procedures, internal communications, housekeeping, or even collection development.

## The Worksheets

The worksheets described below are to be completed with appropriate internal and local information. All of this information must be updated on a regular basis.

*Any form which must be duplicated should be photocopied while it is still blank.*

## Emergency Instructions

Fill this sheet out first, and place it at the very beginning of the manual, so that it will be immediately accessible. It should contain concise instructions for the first actions to be taken in the event of an emergency. Make extra copies and distribute them to staff so that they will be handy when the need arises.

**Evacuation Procedures**

Summarize procedures for evacuating the building in the event of a fire or other emergency.

**Emergency Telephone List**

List the names and telephone numbers of people and agencies who have a need to know, have specific duties to perform, or whose services may be needed.

**Disaster Team List**

List the members of the institution's disaster response team, a brief description of their duties, and the telephone numbers at which they can be reached. See "Organization of In-House Disaster Response Teams" in the Reference Section for suggestions as to what areas of responsibility generally need to be considered.

**General Staff List**

List Library staff members who are not on the disaster team, but who can be called upon to assist in an emergency. This need not be a comprehensive personnel list.

**Security Information**

This form may be used if necessary to list information concerning the security of the building or collections which would affect the response to a disaster, or would otherwise be useful in an emergency.

**Fire Detection and Suppression Equipment**

List separately the locations of fire alarms, smoke detectors, sprinklers, hand-held fire extinguishers, as well as standpipe and hose extinguishers. Include this information on floor plans as well.

**Emergency Supply Kit Locations and Emergency Supply Kit Contents**

These lists enable an institution to locate its emergency supplies quickly and to keep them in stock. The "Emergency Supply Kit" information in the reference section will help to determine what supplies will be needed, and the "Suppliers" listings can be used to locate sources for the more specialized items.

**In-House Resources**

List useful materials, such as cleaning supplies, which are routinely maintained by the institution and which could be drawn upon in an emergency. Also list any services which could be provided by maintenance, physical plant, or other departments, and the names of personnel who could authorize use of these resources.

**Outside Sources for Supplies**

List those materials which are not stored in-house, but can be obtained locally. Include the names and telephone numbers of suppliers. (See the Suppliers listings in the reference section.)

### **Sources for Specialized Services**

List the names of consultants, agencies, or companies, which can provide advice on preparedness or recovery, or specialized services such as dehumidification or freeze drying. (See the Services listings in the reference section.)

### **Collection Priorities**

List materials which are intrinsically valuable, of permanent research value, irreplaceable, or particularly susceptible to damage. The Collection Priorities narrative in the reference section is intended to help in determining physical vulnerabilities of various types of library and archival materials.

### **Collection Priorities Floor Plan**

Use this floor plan to designate high priority items and collections, so that they may be located at a glance.

### **Floor Plans**

Use general floor plans to show stack and office layouts, as well as locations of smoke detectors, fire extinguishers (include also the type of extinguisher), fire hoses, water cutoff valves, electrical outlets, or other features important to the fire department or recovery crews. Smaller institutions may wish to have one set of integrated floor plans with all relevant information included.

### **Floor Plan Descriptive List**

This list supplements the floor plan drawings. Include a brief description of the contents of various locations and the staff members who can be called upon to make decisions concerning protection or salvage of materials in those locations.

### **Internal Hazards Survey and External Hazards Survey**

These worksheets are intended to allow a systematic inspection of an institution and its surroundings. Items marked with an asterisk (\*) indicate potentially hazardous conditions. These surveys are instruments of prevention in that areas of risk can be identified and eliminated. If elimination is not possible, a formal schedule for checking and monitoring these areas on a regular basis should be developed.

### **Internal and External Hazards Inspection Checklists**

Once specific hazards have been identified, list them for regular inspection. The list should include not only the hazards, but also the person(s) responsible for checking them, and the date of inspection.

### **Incident Report Worksheets**

If a disaster occurs, record the date and time of the incident, what part of the collection was affected, who was involved, and what action was taken. Include a brief description of the sequence of events as well.

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# WORKSHEET SECTION

The authors wish to acknowledge the indebtedness of much of the worksheet section to the New York University Libraries Preservation Committee's *Disaster Plan Workbook* (New York: NYUL, 1984).

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## WORKSHEET 1

# EMERGENCY INSTRUCTIONS

Place this sheet at the beginning of the workbook when completed. Include concise instructions for the first actions which are to be taken in an emergency. (A list of standard fire emergency procedures is found in Part 4 of this manual.) Distribute copies of these instructions to all staff members.

## FIRE

Notify \_\_\_\_\_

Summary of Procedures \_\_\_\_\_

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## FLOODING OR WATER DAMAGE

Notify \_\_\_\_\_

Summary of Procedures \_\_\_\_\_

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## IF WATER IS STILL ENTERING

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**WORKSHEET 3**

**EMERGENCY TELEPHONE LIST**

Fire Department

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Police

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Medical Assistance

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Ambulance

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Disaster Response Team (in-house)

---

Director (institution)

---

Alternate

---

Alternate

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Library Director

---

Alternate

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Alternate

---

Security

---

Maintenance

---

Regional Conservation Center

---

Consultants

---

Others

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**WORKSHEET 14**

**FLOOR PLANS SHOWING COLLECTION PRIORITIES**

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**WORKSHEET 15**

**LIBRARY FLOOR PLANS**



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## WORKSHEET 17

# INTERNAL HAZARDS SURVEY

### Building General

- \* Internal finishes or furnishings which burn easily (dry or highly varnished wood imitation or wood veneer paneling, etc.).
- \* Interior finishes or furnishings which give off toxic smoke when burning.
- \* Large, open spaces, high ceilings with concealed spaces.
- \* Windowless areas which would make fire fighting access and smoke removal difficult.
- \* Interior basement walls treated with water-resistant sealer before painting; resealed periodically.
- \* Lack of a public address or intercom system to allow for communication to all parts of the building.

### Compartmentation and Fire Protection

- Fire walls and fire doors around vertical access areas and equipment rooms.
- Collections areas separated from other areas by fire walls and doors.
- Fire doors closed and unobstructed.
- Internal book drops reinforced with fire-resistive material or otherwise protected.
- Fire exit signs visible and illuminated.
- Fire detection and suppression systems regularly inspected and maintained.
- Detection systems connected directly to fire service.
- Fire fighting equipment accessible.
- Sufficient fire extinguishers of proper type, charged and inspected regularly.

### Electrical, HVAC, and Plumbing Systems

- Electrical and plumbing systems regularly inspected and maintained.
- Emergency lighting operable.
- Ventilation ducts clean.
- Automatic fire dampers (metal) on ventilation ducts.
- Circuit breakers and electrical controls accessible; locations marked.
- Water cutoffs accessible and locations marked.
- \* Water pipes or drains running through collection areas.
- Collection environment stable (temperature, humidity).

- \_\_\_ \* Close proximity of collection materials to furnaces, boilers and other potentially damaging systems.

### **Collections and Housekeeping**

- \_\_\_ \* Collection materials stored on floor.
- \_\_\_ Collection materials returned to proper housing after use (i.e. microfilm is returned to storage cabinets, archival material placed back in proper acid-free enclosures, etc.).
- \_\_\_ \* Books shelved improperly: packed too tightly, or hanging over edges of shelves.
- \_\_\_ Nitrate negatives in photographic collections stored separately and properly.
- \_\_\_ Aisles, exits, and stairwells unobstructed.
- \_\_\_ Trash, cleaning rags, etc. disposed of properly and promptly.
- \_\_\_ Combustible trash placed in metal containers.
- \_\_\_ \* Electrical extension cords over six feet; cords run under carpeting.
- \_\_\_ Supply closets and slop sink areas orderly.
- \_\_\_ Supplies stored separately from collections.
- \_\_\_ Solvents and other flammable materials stored in marked containers in cool, safe place out of sunlight and away from heat.
- \_\_\_ Smoking prohibited.
- \_\_\_ \* Computers without surge protectors.
- \_\_\_ \* Computers in rooms with overhead pipes.
- \_\_\_ Rack-mounted computer hardware that is several inches off of the floor

*\* Hazardous Condition*

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## WORKSHEET 18

# EXTERNAL HAZARDS SURVEY

### Climate

- \* Area subject to temperature and relative humidity extremes.
- \* Area subject to heavy storms or precipitation.
- \* Area subject to damage from high winds.

### Surroundings

- \* Building located near a body of water.
- \* Nearby body of water has a history of flooding.
- \* Water level or water table level is above basement of building.
- \* Neighboring buildings in close proximity.
- \* Neighboring buildings exhibit exterior fire hazards or impede fire fighting access.
- \* Road access by large emergency vehicles difficult in certain conditions.

### Building

- Constructed of:  fire-resistant;  non-combustible;  \* combustible materials.
- Regularly inspected and maintained.
- Exterior subterranean walls waterproofed with asphalt or other suitable materials.
- \* Accumulations of flammable materials on grounds.
- Fire and service access clear.
- Fire and service connections (standpipes, hydrants, etc.) unobstructed.

### Roof

- Constructed of non-combustible materials;  pitched;  \* flat.
- \* Over 15 years old.
- Regularly inspected and maintained.
- Readily accessible; entrances and exits unobstructed.
- Fire escapes unobstructed.
- \* Skylights;  screened.
- Has lightning arresters.
- External/internal drains clear.
- Standpipes and sprinkler roof tanks in good condition.

\* *Hazardous condition.*





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**WORKSHEET 21**

**INCIDENT REPORT**

Date: \_\_\_\_\_

Type of Incident: \_\_\_\_\_

Location: \_\_\_\_\_

Personnel Involved: \_\_\_\_\_

Description of Incident: \_\_\_\_\_

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Signature: \_\_\_\_\_

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# REFERENCE SECTION

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# 1. PLANNING

## Aspects of Emergency

To be truly useful, a disaster plan must address all aspects of emergency preparedness:

- Prevention,
- Protection,
- Response,
- Recovery, and
- Rehabilitation

### *Prevention includes:*

documenting and regularly inspecting interior and exterior hazards to the building and collections; regular maintenance of buildings and equipment; proper housekeeping and environmental control;

### *Protection includes:*

installation of alarms, fire suppression systems; establishment of basic building security measures; assembly of emergency supply kits; and the organization of an in-house disaster response team;

### *Response includes:*

the actions which are to be taken on the first encounter with the damaged collections to stabilize the situation as quickly as possible;

### *Recovery and rehabilitation include:*

the steps taken to deal with the disaster over a longer term, often with the help of outside expertise and advice to restore the collection and environment to its pre-disaster condition.

## Setting Up a Plan

There are several ways to set up a disaster plan:

- establish a committee to divide up the tasks involved;
- assign the responsibility to one or two staff members; or
- hire a consultant to prepare a plan.

Unless there are very few staff to draw upon, the **committee method** usually produces the best overall results. The more staff members who are involved in the planning process, the more aware and involved the staff is likely to be. Assigning the responsibility to one or two persons does speed up the process, but may bypass valuable contributions by others. Consultants bring experience and expertise to the task, but cannot know the needs and priorities of the institution nearly so well as do in-house personnel.

It is strongly suggested that committee members be selected from both technical services and public services areas. Of course, the administration should be drawn into the process as early as possible. The “disaster planning” committee should be specifically charged with developing a written disaster plan within a specified period of time. Its members must educate themselves on all aspects of disaster preparedness and recovery appropriate to the institution. This manual serves as a guide to beginning that process. Committee members will want to consult any of the numerous books, articles and web sites available to gain a broader perspective and a more complete understanding of disasters and disaster planning. A select bibliography and list of metasites are available in this manual. Also, it is extremely helpful to read the disaster plans written for other institutions, especially those that are similar in size and collection content.

### **Step 1: Define the Scope:**

- What concerns need to be addressed?
- What special needs does the institution have?
- How much detail will be necessary for the plan to be workable?

### **Step 2: Assess the Collection and Set Priorities:**

- What and where are the various collections?
- Develop protection and salvage strategies based on the value and/or vulnerability of the various components. The Collection Priorities section of the manual provides some guidelines in this area. Setting collection priorities will make action easier, and will reduce losses of irreplaceable items.

### **Step 3: Identify Risks**

- Identify those collections or items at risk. Is the degree of risk based on the collection’s monetary value? Format or physical condition? This may require research into how specific types of material react when exposed to fire, water, smoke, etc.
- Survey the building and the collections to determine potential hazards. Eliminate those which can be dealt with immediately, and make a list of the others to be checked on a regular basis.

### **Step 4: Assess the protective measures already in place to determine if they are adequate.**

- This may require outside consultants. For instance, one can have a local fire marshal or fire safety consultant walk through the building, examine the fire detection and suppression systems and make recommendations.
- If your library or archives is part of a larger organization, for example a college, university or corporation, find out the policies and procedures of that institution with regard to disaster planning and response. What disaster planning approach does the parent institution take with regard to your library? Is this acceptable? Be sure that any response plans developed in-house will also work in synchronization with the plans of the institution.

All of the information gathered can be entered on the various information sheets contained in this manual, and can be supplemented by lists, floor plans, and/or narratives that are appropriate for the needs of the institution. It is important to establish goals for the completion of sections of the plan. **Set deadlines and stick to them.** When the plan is finished, distribute it to staff and schedule time for education and training.

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## 2. COLLECTION PRIORITIES

### INTRODUCTION

Assigning priorities for protection and salvage of various parts of the collection is a very important part of disaster planning. The first priority in any disaster, however, is **human safety**.

*“Saving collections is never worth endangering the lives of staff or patrons. In a major event, the fire department, civil defense authorities, or other professionals may restrict access to the building until it can be fully evaluated. Once safety concerns are met, the next consideration will be records and equipment crucial to the operation of the institution, such as registrar’s records, inventories, and administrative files. Collections salvage and building rehabilitation will be the next priority.”<sup>1</sup>*

When priorities are established ahead of time, decisions can be made rationally and in as much detail as is required. The priority list can be very general, indicating names of collections or ranges of stacks, or it can specify individual volumes and boxes of documents. Collection priorities marked on a floor plan will show the necessary information at a glance. The list should clearly state which items or groups are to be protected or salvaged first, second, third and so on, and which can be left until last. There are a number of factors to consider:

- Whether the item or collection can be replaced, and the difficulty of doing so.
- Whether it can be replaced in a different format, such as microfilm.
- Whether the items are significant as a *collection*, as opposed to a group of individual volumes or documents.
- The value of the collection for scholarly research, for supporting the mission of the institution, and its value as a regional, state, or national resource.
- The monetary value of the item or collection.
- The vulnerability of the materials of which the item or collection is made; how quickly and how badly it will be affected by water or fire.
- The likelihood that in a given type of disaster, the collection would be unsalvageable, and therefore not worth the effort.

With these considerations in mind, focus first protection efforts and salvage work on.<sup>2</sup>

- Vital institutional information; employee and accounting records, documents with significant legal, administrative or fiscal value, accession lists, shelf lists and database backups.
- Items on loan from individuals or other institutions.
- Collections that most directly support the institution's mission.
- Collections that are unique, most used, most vital for research, most representative of subject areas, least replaceable or most valuable.
- Items most prone to continued damage if untreated.
- Materials most likely to be successfully salvaged.

Without proper planning or priorities, time and effort and ultimately money may be wasted salvaging materials of little value. *The onset of a disaster is not the time to be arguing about what should be saved first.* Ideally, planning should include a floor plan that clearly states the priority of collections for salvage.

## DAMAGE OF MATERIALS

Vulnerability to the particular damage caused by an emergency is as important in setting salvage priorities as the value of object and collections. General information on the effects of water and fire damage are outlined below. If you are not knowledgeable about the hazards for various materials, contact a conservator to help you incorporate these considerations into your salvage plan.

### Damage From Water

Library and archival materials are complex in their composition, and may react differently to water according to such factors as age, method of manufacture, and state of deterioration. However, assuming that the water is clean, and is not carrying mud, oil, sewage, or other contaminants, the following types of damage to library and archival materials are fairly typical of water incidents:

#### Book-Related Materials

- **Adhesives**  
Many glues and pastes used in the manufacture of books are water-soluble, and may dissolve completely or in part when the book gets wet. This can cause components of the book to separate. Dissolved glue may come into contact with other materials which may then stick together when the glue dries. Adhesives that are not water-soluble, may also damage wet materials, restraining the glued portions of paper or board while the rest of the wet material changes dimension due to absorption of water.
- **Boards**  
The boards used in book covers are usually very absorbent, swelling to many times their original thickness when very wet. Since boards are restrained by

covering materials and adhesives and are thus unable to swell evenly, they tend to warp and buckle. In extreme cases they can pull the cover loose from the book. Alternately, they may lose their integrity entirely and disintegrate. Some boards, such as strawboard and certain types of poor quality millboard, can also stain materials with which they come into contact. Damp boards provide a good medium for mold growth if preventative measures are not taken.

- **Cloth Covers**

The cloths used by publishers to cover books vary in their quality and reaction to water. Cloth colored by water-soluble dyes, will often run, staining adjacent materials. The starch used to stiffen the cloth and keep glue from penetrating may soften or dissolve, resulting in damage to adjacent items which may stick together upon drying. Starch-filled cloths are extremely vulnerable to mold growth in damp conditions. The pyroxylin-coated buckram covers supplied by commercial library binders ("library buckram") generally survive water emergencies better than publishers' or other starch-filled cloths, but they have been known to stick to adjacent items after drying. The strength and relative lack of flexibility of library buckram can also cause problems; if the water softens the glue used to apply it to the cover, and the expansion of the boards puts pressure on the turn-ins, the stiff cloth may tear through the weakened endpapers.

- **Leather**

Depending on its condition and the method of tanning used, the leather in bindings can be very badly damaged by water. Dessicated leathers, and those suffering from "red rot," are particularly vulnerable, and may well be ruined by wetting. Wet leather bindings may shrink (often unevenly), lose the gilt from their tooling, or be transformed into a blackish sludge, which dries in hard clumps on the book. Leather will also sustain mold growth in damp conditions.

- **Paper**

Paper is the major text support in libraries and archives, and is also very vulnerable to water damage. Some types of paper may come through a water incident better than others, however. Those papers made from linen and cotton rags are easier to salvage, and generally lose less of their character, than papers made from cellulose fibers derived from wood, particularly if the latter are "filled" or heavily sized. Coated paper will stick to whatever is in contact with it when wet (sometimes even in conditions of high humidity); if the entire volume is printed on coated stock, it can fuse into a solid block as it dries. The rule of thumb given for salvage of wet items printed on coated paper is that one has about six hours after the disaster to get them into a freezer, or the damage is likely to be irreparable.

All wet paper is liable to swell and change dimensions; if the documents are single sheets, this is generally less of a problem than for bound volumes. Single sheets, if they are wet evenly, are free to react more or less uniformly. Paper that is bound into a book is held in position at the spine by thread and adhesives, and therefore swells more at the foreedge. This results in wedge-shaped volumes, which may force themselves and other books off the shelves as they grow larger. It is very difficult to flatten a bound volume which has been distorted in this manner.

Other water damage includes possible running or "feathering" of soluble media such as some writing inks, watercolor paints, and occasionally dyes used in colored printing inks. In addition, some products of the decomposition of the

paper itself are colored (usually yellowish or brownish), and if water soluble, will move when the paper is wet, causing a stain where they are deposited. A partially wet sheet of paper may thus develop a "tide line" along the edge of the affected area. Finally, as with other library and archival materials, paper is a favored food source for mold.

- **Vellum**

Vellum is very susceptible to water damage, as it is very reactive to moisture. It cockles, shrinks, and distorts as it dries, and it can dry very hard. This sort of damage can be very difficult, if not impossible, to repair. Vellum drying on a binding can exert a tremendous pull on the boards and force them out of shape. Vellum tips at the corners of boards can spring loose through the cover materials and endpapers. As with leather, it can sustain mold growth in damp conditions.

### **Photographic Materials**

Photographic materials that are paper-based, such as most prints, face the same sort of damage from water as other paper documents. However, prints are composed of layers of materials which react to moisture at different rates. The paper support swells much more quickly than the emulsion layer, for instance. The image layer may soften and swell also, eventually separating from the paper, or sticking to adjacent photos. If the photograph is a color print, the color layers of the image may separate, or there may be some loss of dye. The same problems may occur with color slides.

The emulsions used on glass plate negatives are particularly vulnerable, and may stick to anything in contact with them. In some cases, they may be washed off the glass entirely. Nitrate negatives also tend to have a relatively soft gelatin emulsion, and are more at risk than motion picture films and negatives on safety stock, but these too will become damaged on prolonged exposure to water. Other problems include warping of slide mounts, loss of labels and written labeling information, and the possibility of mold growth.

### **Microform Materials<sup>3</sup>**

Microforms are highly susceptible to water damage. Once wet, this material must not be allowed to dry in rolls or enclosures as it will stick to itself and to the enclosures. Diazo film or fiche contains diazonium salts in the coating layer that combine with dye couplers to produce strong, dense colors, as well as black. This material is prone to water spotting.

### **Audio/Video and Sound Recording Materials<sup>4</sup>**

- **Phonodiscs**

Vulnerability to damage depends on the material that comprises the phonodisc. Vinyl discs tend to be the most durable and are not susceptible to water damage unless the water is contaminated with abrasive particles. The sleeves which house the discs however are easily damaged by water and will easily swell and warp. Acetate, vulcanite and shellac discs are also vulnerable when exposed to water and humidity. Damage can range from shrinkage of the

lacquer coating of an acetate disc to embrittlement of shellac discs. This embrittlement causes a fine powder to be shed from the disc after each playback, effectively scraping away groove information.

- **Magnetic Media (Audio and Videotapes)**

Moisture causes a chemical reaction called binder hydrolysis. Molecules in the recording and backing layers react with the moisture and break down, leaving a sticky residue. Eventually the tape becomes too sticky to use.

- **Audio CD**

The compact disc or laser optical disc, is a laminate of 4 different materials. The bottom of the disc is made of polycarbonate onto which the pits containing the digitized information are stamped. A thin layer of aluminum is then applied, covering the pits. A thin lacquer coating (which becomes the top of the disc) is then applied to cover the aluminum layer, and finally the ink for the labeling. This media is not as vulnerable to damage by uncontaminated water although it is not clear how prolonged exposure would affect the integrity of the laminates.

### Computer Data Storage Materials

- **Magnetic Media (diskettes, zip disks, etc.)**

Also referred to as “removable media”

Diskettes are susceptible to the same kind of damage found with magnetic audio and videotape. Binder hydrolysis can result not only in data loss, but also in damage to the physical components of any computer hardware that water damaged diskettes may be loaded into.

- **CD-ROMs, DVDs and Other Laser Optical Discs**

See Audio CD, above.

### Networked Systems

Hardware can sustain water damage without many problems. To minimize possibilities of damage from standing water, servers and computer hardware should be rack-mounted at least six inches from the floor.

Damage to software is dependent upon the medium of the data storage (see Computer Data Storage Materials, above.) Since the durability of data stored on computer hard drives and servers is unpredictable, the importance of backing up critical data files cannot be overemphasized.

### Damage from Fire

Libraries and archives are extremely combustible. If a collection is not consumed by the flames, there is still likely to be considerable damage from heat and smoke. Books which were not directly in the path of the Los Angeles Public Library fire, for example, were still charred at the edges by the tremendous heat generated by the blaze. Soot can travel from the site of a fire throughout an entire collection as well. Damage from heat and smoke may include the following:

## **Book-Related Materials**

- **Adhesives**

Some adhesives may melt, and be absorbed into paper or cloth. Others may harden and discolor.

- **Cloth Covers**

These may be permanently stained by soot, which contains extremely fine particles of carbon. Soot also contains larger, rougher particles, which can be very abrasive. Excessive heat may increase oxidation of the materials and cause embrittlement.

- **Leather**

Leather may also be stained and abraded by soot. In addition, heat from a fire could result in desiccation, embrittlement, and discoloration of the binding.

- **Paper**

Paper is subject to the same effects as cloth, though the interior of a bound text may suffer less than the exposed edges.

- **Vellum**

Vellum suffers badly from soot staining and abrasion, and is also liable to embrittlement, shrinking, and discoloration from excessive heat.

## **Photographic Materials**

Paper supports and mounts may become embrittled, emulsion layers may shrink, warp, or even melt in the heat from a fire. Staining and abrasion from soot particles are even more dangerous to photographic images than to other documents, as the damage is more difficult to repair. An additional hazard is posed by nitrate negatives, which are extremely combustible, and may burst into flame if exposed to high enough heat. How high is "high enough" depends on the thickness of the film, and its state of decay.

Another potential source of damage is the type of cabinet in which the photographs are stored. For archival preservation purposes, metal cabinets are recommended over wood. Given high enough temperatures, however, the contents of metal cabinets are subject to a "baking effect" which, in the case of photographic materials, can result in significant damage to the paper mounts and/or the emulsion layers.

## **Microforms**

Film and fiche are vulnerable to any kind of significant heat, which will cause them to blister, shrink, warp or melt. If the heat is high enough the emulsion layers will separate or the film may actually burn. As with other photographic materials, microforms are subject to the "baking effect" caused by heat exposure to metal cabinets as well as damage by soot and smoke particles. Of course the boxes and sleeves in which most microforms are stored are also flammable since they are usually paper-based.

## Audio/Video and Sound Recording Materials

- **Phonodiscs**

Vinyl discs are susceptible to heat and temperature fluctuations which, if significant enough, will cause distortions in the disc. This warping can be quite severe and under conditions of extreme heat disks may melt. Shellac discs are prone to embrittlement while heat catalyzes chemical reactions to acetate and vulcanite discs. If not damaged by actual fire, the heat may cause accelerated decomposition of these disks. All phonodiscs may be easily damaged by the abrasive particles in soot and smoke.

- **Magnetic Media (Audio and Videotapes)**

Heat aggravates binder hydrolysis. It also causes tape to expand and contract producing creases, stretching and structural damage. Smoke particles, dirt and debris contaminate the surface of the tape and block playback machinery from reading the signal. Dirt also gets inside tape wraps, causing deformation and abrasion of the tape surface.

- **Audio CD**

Compact discs are vulnerable to high temperature. The polycarbonate substrate, which seals the layers of the CD together, may soften at 100°C.<sup>5</sup> The coating of the CD may also be damaged by the abrasive materials contained in smoke and soot.

## Computer Data Storage Materials

- **Diskettes, zip disks and other removable magnetic media**

See magnetic media above. The plastic and metal casings are susceptible to warping and embrittlement from heat and may cause damage to the magnetic tape, which is itself vulnerable. Heat may lead to warping stretching, etc. Soot will also result in damage to the surface of the tape which will lead to data loss. As with water, a diskette damaged by heat can in turn damage any computer drive into which it is loaded.

- **CD-ROMs, DVDs, and Other Optical Laser Discs**

See Audio CD, above

## Networked Resources

Computer hardware and peripherals can become coated with dust, soot or debris during a fire. This may create problems if the solid materials work into the casings of the hardware to reach the electronic components. The risks caused by excessive heat must also be considered. Excess heat (above 68° F) under non-fire conditions is the most commonly reported cause of server downtime and damage.<sup>6</sup> The degree of heat damage caused by a fire could be catastrophic.

As with the threat of water, the extent of fire damage to software depends on storage media. Data stored directly on the hardware is susceptible to system failures caused by damage to that hardware. Again, backing up this data is imperative in order to minimize threat.

## Notes:

1. Beth Lindblom Patkus and Karen Motylewski, "Disaster Planning," NEDCC Technical Leaflet: Emergency Management – Sect.3: Leaflet 3. c1999. Online. URL: <http://www.nedcc.org/plam3/leaf33.htm> (Accessed Sept. 2003).
2. "Response and Recovery", *FEMA.gov : Federal Emergency Management Agency*. Online. URL: <http://www.fema.gov/rrr/> (Accessed Sept. 2003)
3. Steve Dalton. "Microfilm and Microfiche," NEDCC Technical Leaflet: Reformatting, Sect. 5, Leaflet 1. February 1999. Online. URL: <http://www.nedcc.org/plam3/leaf51.htm> (Accessed Sept. 2003)
4. From Gilles St-Laurent, "The Preservation of Recorded Sound Materials," National Library of Canada, Music Division. Online. URL: <http://audio-restoration.com/gilles.php> (Accessed Sept. 2003).
5. Miriam B. Kahn. *Disaster Response and Planning for Libraries*, 2<sup>nd</sup> ed. Chicago : American Library Association, 2003. p.79.
6. Boss, Richard W. *Disaster Planning for Computers and Networks*. Chicago: American Library Association, Public Library Association, 2002. (Accessed Sept. 3, 2003) URL: [http://www.ala.org/Content/NavigationMenu/PLA/Publications\\_and\\_Reports/Tech\\_Notes/Disaster\\_Planning.htm](http://www.ala.org/Content/NavigationMenu/PLA/Publications_and_Reports/Tech_Notes/Disaster_Planning.htm)

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## 3. PROTECTION

### EMERGENCY SUPPLY KITS

To insure protection of the collection, emergency supply kits should meet immediate needs following a disaster. Their contents may vary somewhat according to the resources and collections of any given institution, but there are certain basic supplies which constitute the minimum for preparedness to meet emergencies. These are listed below, along with other items which are also useful.

Emergency supplies can be stored in a central location, or placed in the areas where they are most likely to be needed when an emergency occurs.

- Kits should be easily accessible and clearly marked.
- Their locations and contents should be recorded in the overall disaster plan.
- There must be a strict "No Borrowing" rule for all emergency supplies; they must be available when they are needed, or valuable time will be lost.
- Supplies with a limited shelf life, such as flashlight batteries, must be tested and replaced periodically, in order to prevent possible serious inconvenience.
- Any supplies which are used during a disaster should be promptly replaced in the supply kits.

### Essential Supplies:

- **Block weights**  
For flattening materials.
- **Boxes.**  
For packing wet materials. The best containers for this purpose are plastic milk crates, which provide good drainage, are not easily crushed, and stack well. However, corrugated boxes of the proper size (no more than 12x15x10") and sturdiness will also serve, and are preferred by some of the freeze drying companies. One major advantage of corrugated boxes is that they can be folded and stored in much less space than can milk crates. Inexpensive collapsible plastic crates are also available for purchase.
- **Brooms, mops, squeegies and buckets.**
- **Dust filter masks.**
- **Extension cords.**  
These should be heavy duty grounded extension cords 50 feet or more in length.
- **Fans.**  
The larger the fans, the better the air circulation they will be able to provide.

- **First aid kit.**
- **Flashlights and batteries.**
- **Hair dryers (hand-held).**
- **Labels.**  
For labeling boxes and crates.
- **Paper towels or unprinted newsprint.**  
For interleaving and covering the drying tables.
- **Polyethylene sheeting.**  
Used to protect bookshelves, furniture, etc., from water. It comes in rolls or sheets, and its thickness is measured in mils (one mil = 1/1000 of an inch.) Rolls are usually more economical. The most practical thicknesses are in the range from 3-6 mils. The thicker the sheeting, the less likely it is to tear, but the more bulky, unwieldy, and expensive it becomes. It is helpful to have at least part of the institution's stock of plastic sheeting pre-cut to the desired lengths and widths, in order to save time in an emergency.
- **Scissors or other cutting tools.**  
For cutting the plastic sheeting. Some experts recommend the razor blade type cutters known as "zippy cutters" as being easier on the hands than scissors and less likely to become dull. A good quality pair of scissors will serve quite well, however, and is more versatile than a "zippy."
- **Sponges.**
- **Tape.**  
Tape is useful for sealing boxes, and for holding plastic sheeting in place. It must not be used on books or other materials. Masking tape is easily obtained and reasonably cheap, but plastic carton sealing tape holds up better in wet conditions.
- **Waterproof marking pens.**  
For marking boxes.
- **Wax paper.**  
For interleaving coated stock and wrapping books for freezing.
- **Work lights—electric and battery-operated.**
- **Writing paper and pens.**  
For documentation.

### **Other Emergency Supplies:**

- **Aprons (preferably with pockets.)**
- **Book trucks, handtrucks.**  
For transporting books, materials.

- **Camera, film.**  
For documenting the damages.
- **Chemical light sticks.**  
May be used for limited emergency lighting when electric power is not available, and also for marking pathways and obstacles.
- **Dehumidifiers.**  
Use industrial dehumidifiers for bringing down humidity levels in confined spaces. Small, household units are generally too small for salvage work.
- **Disinfectant (bleach, Lysol, etc.)**  
For use on shelves and other furniture to prevent mold growth. Not to be used on books or any other library or archival materials.
- **Fishline.**  
For hanging partially wet books which have become distorted due to interleaving and swelling from water. Returns spine to original shape.
- **Generator, portable.**  
Provides electricity for fans, lights, dehumidifiers, etc., if electricity is not available.
- **Hygrometer.**  
For measuring relative humidity and temperature. Good for spot-checks in the stacks and other areas.
- **Pallets, forklifts.**  
Useful in large recovery efforts when removing wet books.
- **Parchment**  
For interleaving coated stock and wrapping books for freezing.
- **Plastic garbage bags.**  
For disposal of debris and wet air-drying papers.
- **Rubber gloves and boots.**
- **Safety fencing.**  
Bright colored plastic ribbon for roping off disaster site.
- **Toilets, portable.**
- **Walkie-talkies.**
- **Wet-dry vacuums.**

## HUMAN RESOURCES

### Organization of In-House Disaster Response Teams

To facilitate quick response to disaster, each institution should organize an in-house response team. In-house teams can also be supplemented by local

volunteers if necessary. Both of these groups will require training. The in-house team members should be trained ahead of time to be able to function in an emergency with a minimum of confusion. The team members should be made familiar with the disaster plan in general and especially with the Emergency Instruction Sheet. They should also know the locations of fire extinguishers, fire alarms, emergency supply kits, and parts of the collection with a high salvage priority. At least one member of the in-house team should be designated as a trainer, and become familiar with salvage techniques by attending workshops and by reading this manual as well as other materials from the accompanying bibliography.

In organizing in-house teams, the following decisions should be made and recorded in the disaster response manual.

- *who should be notified first when disaster strikes.*
- *how the necessary institutional staff, other team members, and volunteers are to be notified.*
- *who is to make the initial assessment of damage.*
- *who is to supervise work crews.*
- *how the team and other staff are to be trained, and what that training should include.*
- *whether or not the institution's insurance policy will extend to cover volunteers.*
- *who trains the volunteers at the disaster site.*
- *where workers are to meet to begin rescue operations.*
- *which consultants and services should be contacted and at what point.*
- *who is responsible for turning off the water or other building systems.*
- *what documentation procedures are necessary, and who is responsible for carrying them out.*
- *how communication is to be handled.*
- *which person should issue information and talk to the media about the disaster.*
- *who will organize the recovery phase.*
- *what the insurance carrier requires as documentation of loss in case a claim is made.*
- *who will write up the incident reports.*
- *who will be responsible for getting the computer systems up and running.*

## FIRE PROTECTION

*“Cultural property management is entrusted with the responsibility of preserving an institution’s buildings, collections, operations and occupants. ... Because of the speed and totality of the destructive forces of fire, it constitutes one of the more serious threats. Vandalized or environmentally damaged structures can be repaired and stolen objects recovered. Items destroyed by fire, however, are gone forever.”*—Nick Artim, Director, Fire Safety Network, Middlebury, VT.

### Institutional Impact of Fire

- Collections damage.
- Operations and mission damage.
- Structure damage.
- Knowledge loss.
- Injury or loss of life.
- Public relations impact.
- Building security.

Fire protection programs are imperative to minimize the risk and impact of fire. System and program types are dependent upon the type and construction of the building, its uses, the type of occupants, local mandated codes, not to mention the sensitivity and value of the building’s contents. Fire protection usually takes the form of installation of fire detection and suppression equipment, although it should also include preventive measures. These include periodic hazard inspections by in-house and fire department personnel, proper use and care of the building’s electrical and HVAC systems, good housekeeping, and the prohibition of smoking. It is far better to develop an overall fire protection plan, including the best feasible prevention, detection, and suppression measures, than to rely on stop-gap measures and luck. Consulting with the local fire department and/or professional fire protection consultants can be very helpful in this regard. In addition, there may already be one or more institutional staff members whose business it is to know about local fire and building codes, the construction of the library, and the fire detection and suppression systems already in place. These persons should of course be included in any fire protection planning.

The following information is a brief outline of the fire detection and suppression systems available. *This information is not intended as a substitute for consultation with qualified fire protection personnel.*

### Fire Detection Systems

Fire detection systems are designed to identify a developing fire emergency in a timely manner and then notify building occupants and emergency response organizations. Such detection systems comprise a wide variety of devices which sense the presence of smoke, heat, and/or flames, and send out a warning signal. While detection devices do not act to put out fires, some of the “intelligent systems” can close dampers and fire doors, or open valves to allow water into sprinkler pipes; they also can sound an alarm within the building, at a fire

department or central alarm-monitoring station or both. The most useful alarms are those which are activated where they will be monitored (the fire department or central station); should a fire occur when the building is not occupied, an alarm bell sounding on the premises will do no good. A description of the principal types of alarms, summarized from John Morris' *Library Disaster Preparedness Handbook* (1985,) and Nick Artim's *NDCC Technical Leaflet "In Introduction to Fire Detection, Alarm and Automatic Fire Sprinklers"* (1999, 2003) describe the types of detection devices on the market.

**Thermal Detectors** have proven quite reliable and are the oldest of the fire detection devices.

- *Fixed temperature detectors* activate when the room reaches a pre-determined temperature, usually in the 135°-165°F (57°-74°C) range.
- *Thermal rate-of-rise devices* contain a chamber with a very small opening for the escape of expanding air. When the heat from a fire causes the air in the chamber to expand more rapidly than it can escape from the vent, an alarm is sounded. These devices are often accompanied by a fixed temperature alarm for extra protection.
- *Fixed temperature line-type detectors* consist of two cables separated by an insulated sheathing. When exposed to heat, this sheathing breaks down and the device is activated. Line-type detectors are a cost effective approach to increasing monitoring range.

While relatively inexpensive and quite reliable thermal sensors are limited by the fact that they are not designed to activate until temperatures reach a point where a fire is well underway. Artim stresses that these devices are not permitted in life safety applications. Furthermore, they are not recommended for use in areas where it is preferred that fire be identified *before* substantial flames develop—for instance, a manuscript room or archives.

**Smoke Detectors** are designed to identify fire while still in its early stages. The most common are spot detectors, much like those found in the home, which are mounted on ceilings and high walls. They operate on one of two principals, photoelectric or ionization.

- *Ionization detectors* sound an alarm when visible or invisible combustion products enter a chamber in the device, interrupting the flow of electrical current through it. These are the most common.
- *Photoelectric smoke detectors* activate an alarm when smoke obscures a beam of light within the device. One type, the *linear beam smoke detector*, utilizes an infrared beam projected from a transmitter mounted on one wall to a receiver on the opposite wall as far away as 300 feet, and can detect light or dark smoke. These are well suited for atriums and other large rooms.
- *Air aspirating systems* consist of a network of tubes and pipes. Samples of air are periodically drawn into the tubes at ports throughout the network and tested for the presence of smoke. If detected, an alarm signal is transmitted to a main fire control panel. This system is the most sensitive of the smoke detection devices.

As mentioned, smoke detecting devices identify fire while it is still in its early stages of development, allowing for response and control before a fire becomes damaging. While highly reliable, smoke detectors are more expensive to install and more prone to false alarms than are thermal detectors.

**Flame Detectors** are line of sight devices that operate on infrared or ultraviolet detection principles and identify radiant energy that reaches the level indicative of a “flaming condition.” Flame detectors are available in several forms, but are more suited to industrial applications.

### **Contracting with Central Detection Systems**

Smaller libraries often contract with a local security firm with central station capacity for their detection systems, but the decision as to which system to choose should not include input from any person or firm with a financial interest in its purchase, installation, or maintenance. Check the possible contractors' credentials, local reputation, and experience before placing a contract. Primarily, the contractor is expected to receive alarm calls and take immediate action on them. The contract should also include provision of regular inspections of the system, maintenance (including standby battery systems), and recordkeeping on inspection, maintenance, and alarm calls.

## **Fire Suppression Systems**

Fire suppression systems that operate automatically are the most effective defense against fire in buildings. The most common systems installed in libraries use water distributed by sprinklers as sprinkler systems are generally inexpensive and cost-effective. There are some alternatives, since water is not always the most desired means for extinguishing fires.

### **Sprinkler systems.**

Nick Artim describes the benefits of sprinkler systems.

- *Immediate identification and control of a developing fire.* Sprinkler systems respond at all times, including periods of low occupancy. Control is generally instantaneous.
- *Immediate alert.* In conjunction with the building fire alarm system, automatic sprinkler systems will notify occupants and emergency response personnel of the developing fire.
- *Reduced heat and smoke damage.* Significantly less heat and smoke will be generated when the fire is extinguished at an early stage.
- *Enhanced life safety.* Staff, visitors and fire fighters will be subject to less danger when fire growth is checked.
- *Design flexibility.* Many fire and building codes will permit design and operations flexibility based on the presence of a fire sprinkler system.
- *Enhanced security.* A sprinkler controlled fire can reduce demand on security forces by minimizing intrusion and theft opportunities.

- *Decreased insurance expenditure.* Sprinkler controlled fires are less damaging than fires in non-sprinklered buildings. Insurance underwriters may offer reduced premiums in sprinkler protected properties.

Sprinkler systems come in various types, and can be custom-designed to fit the degree of fire hazard. They consist of a network of pipes fitted at intervals with nozzles or sprinkler heads.

- *Wet pipe systems* are those in which the pipes are constantly charged with water. This system is simple and reliable. They have relatively low installation and maintenance costs and are easily modified to meet changing needs and standards. However, they are not well suited to areas where piping is subject to subfreezing conditions.
- *Dry pipe and preaction systems:* The water is retained in the reservoir until fire or smoke is sensed by a detector. While less subject to leaking and well-suited for unheated areas such as warehouses, these systems are more expensive and less easily modified than wet pipe systems. They also result in increased fire response time.

There are also several types of **sprinkler heads** available.

- *Standard heads* open when they are heated to critical temperature and the metal cap or plug (made of an alloy with a low melting temperature) fails and lets the water out. They will continue to discharge until the water is shut off.
- *"On-off" sprinkler heads* are designed to open above a fire and then shut themselves off when the fire has been put out; if the fire rekindles, they will open up again. On-off heads require more careful maintenance than do the standard heads, but will reduce the amount of water damage done to the collection.
- *Deluge sprinklers* should be avoided if possible, especially where libraries and archival storage facilities are concerned. Deluge systems are usually used for warehouses and industrial storage. They are less expensive than some systems, but are designed to release water from every sprinkler head once activated, regardless of where a fire source may be located. This can potentially result in a great deal of unnecessary water damage.

#### **Water Mist systems.**

These systems discharge limited water quantities at higher pressure than traditional sprinkler systems. Smaller droplets of water are released but with the higher pressure, there is much higher efficiency cooling and fire control. Fire can be controlled with 10-25% less water than traditional sprinklers and thus minimize the water saturation problems inherent with fire suppression systems that use water. Mist systems may serve as an effective substitution of the Halon 1301 gas suppression system (discussed below).

#### **Gas Extinguishing Systems.**

The only alternative to water for extinguishing fires is gas, as foam systems are not appropriate for use with library and archival collections. Gas systems

generally operate by totally flooding an area to reduce the amount of oxygen available to the fire. They require an enclosed space to be totally effective. Doors and windows must be closed, as well as the dampers of the ventilation system. Two types of gas systems are currently in use, Halon and Carbon Dioxide.

- **Halon Systems.** Halon 1301 is a colorless, odorless, and non-toxic gas which extinguishes the fire by chemically reacting with the combustion process. As of 1994, however, Halon suppression systems, common in archives and manuscripts storage areas, have been taken off the market because of environmental concerns over the use of freon (an ozone-destroying chlorinated fluorocarbon) as a propellant. While existing systems are legal and still in use, the Environmental Protection Agency has prohibited new installations of Halon systems, and those currently in use must replenish their gas supply with recycled Halon.

#### *Possible Alternatives to Halon*

- Alternative gas systems (i.e. CO<sub>2</sub> systems discussed below)
- Water Mist Systems (see above)
- Dry pipe and preaction systems (see above)

- **Carbon Dioxide Systems** Similar to Halon, these systems use carbon dioxide as the oxygen smothering gas.

CO<sub>2</sub> systems, like many others utilizing gas as the suppression agent, are not approved for use in people-occupied spaces because their activation can result in suffocation. They are very effective when used in book drops, vaults and stacks with restricted access, however. There are new gases under development as a replacement for Halon, but such gases react with books, art media and the materials found in library and museum collections in different ways. Some can be as potentially destructive as fire and are still under study.

For general collection storage and mixed-use spaces (having both people and collections), sprinklers are presently the best option. For enclosed storage areas containing valuable collections which would be ruined by water, i.e. manuscript or print storage rooms, rare stamp collections, etc., gas systems may well be a better choice. Such systems are most often outfitted with alarms that provide for delayed release of the fire suppression gas, thus allowing a brief interval of time for evacuation.

### **Portable Fire Extinguishers**

Fire extinguishers may be used to put out small fires, if, indeed, there is anyone around to do so when the fire starts. If a small fire is discovered, the first step is still to call the fire department, and only then to attempt to put it out. The delay could be disastrous, if for some reason the portable extinguisher proves ineffective. All staff members should be trained in proper use of fire extinguishers, and know what type is appropriate for what type of fire.

There are four types of fire extinguishers suitable for use in libraries: pressurized water, dry chemical, Halon and carbon dioxide. (Again, no new Halon extinguishers may be manufactured. However, existing extinguishers may be recharged with recycled Halon.) Each extinguisher is labeled according to the type of fire it should be used to put out.

**Class A** fires are those involving paper, wood, and textiles. They can be extinguished by pressurized water, Halon, and dry chemical extinguishers.

**Class B** fires involve oils, greases, paints, and flammable liquids. They can be extinguished by Halon, dry chemical, and carbon dioxide extinguishers. **Do not** use pressurized water units on Class B fires.

**Class C** fires are electrical fires. Use dry chemical, Halon or carbon dioxide extinguishers, but **do not** use pressurized water. For instance, Class C fire extinguishers should be available in all areas where computers are in use.

## Standard Fire Emergency Procedures

According to John Morris' s *Library Disaster Preparedness Handbook*, the standard fire emergency routine is approximately as follows. When a fire is discovered, the discoverer should:

- Warn others in the immediate vicinity and in the building. Know the evacuation procedures.
- Send the alarm through a manual alarm-sending station or by telephone to the fire department.
- Confine the fire by closing doors and windows, and shut down the air handling system to prevent circulating the fire gases and smoke throughout the building.
- Take any fire-fighting action that does not expose yourself or others to injury.
- Take any pre-planned action which will protect valuable property and vital records.

All staff members should be trained in a routine incorporating these and other appropriate measures. The less delay there is in contacting the fire department, the less damage there will be. ***In all cases, the safety of any persons who are in the building must take precedence over that of the building and its contents.***

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## 4. RESPONSE

### ASSESSMENT OF DAMAGE

Scale is an important consideration in response to disaster, since the size of the emergency in many ways determines what needs to be done. Figures for roughly estimating the scope of a disaster are given below for convenience. However, an emergency consisting of only a gallon of unwanted water can be considered devastating if it ruins irreplaceable materials. Having planned in advance at approximately what point to call in volunteers and/or professional services, and what might be a logical use of people and supplies at various levels of emergency can save valuable time and help prevent costly mistakes. There are no hard and fast definitions of scale, and every emergency must be assessed by subjective as well as objective factors.

Definitions of disaster scope may vary from institution to institution, but a three-tier system of assessment (i.e. small, moderate, and large) is useful for quick analysis. Suggested numerical guidelines for categories:

- Small: Up to 300 books/materials affected.
- Moderate: Over 300 but fewer than 750 books/materials affected.
- Large: Over 750 books/materials affected.

The scope of the disaster will determine whether the problem can be handled by in-house staff, or whether outside consultants, service contractors, or volunteers must be called in. It will also affect salvage decisions, such as whether to freeze or to air-dry materials. If the number of items damaged exceeds the table space available for sorting and drying, then some freezing is definitely in order.

Numbers are important, but the degree to which materials are wet should also be taken into account. Fifty books that have been damaged by a slow leak usually presents less of a problem than the same number of items found floating in a puddle of water. There will also be subjective factors affecting any assessment of damage: what part of the collection is affected; the relative severity of damage likely to be suffered by the types of materials involved; and the position of the damaged materials on the collection priority list. A flood which soaks bound volumes of current news magazines, for example, can be considered less catastrophic than one which ruins a collection of 19<sup>th</sup> century foreign journals, which are much less easily replaced.

In addition to books, other materials such as photographs, microforms, audio and digital media as well as computer hardware and software are subject to damage. The numbers affected and degree of damage should be assessed using the same factors listed above.

Once the scale of a disaster has been determined, the disaster team will have a basis for decisions, and a starting point for consultation with outside sources of assistance.

## GETTING SALVAGE STARTED

No one should enter the scene of a disaster until permission has been given by a safety officer or fireman. Wet floors may present the danger of falling or electric shock and the fire damage may have resulted in destabilized flooring, ceiling and walls. When it is safe to enter the collections areas, one should ascertain whether there is still water coming in through leaky pipes or roofs, if windows are broken, or if there is other structural damage to the building. Assuming that there is no threat to human life, problems which pose an immediate hazard to collections are the first priority for action.

### Training Staff and On-the-Spot Volunteers

Staff and volunteers have to be trained in salvage techniques on-the-spot, usually under adverse conditions. They will be eager to help, at least initially, but should not be allowed to begin salvage operations until they have received instruction in basic salvage techniques. A rule of thumb for volunteer enthusiasm in disaster assistance is that it lasts for approximately 72 hours, then falls off sharply. Training of volunteers should be done by a member or members of the disaster team with some experience in handling wet and damaged materials, even if it was only in a workshop. Failing that, the trainer must at least be familiar with written instructions for salvage, such as those given in this workbook and in various publications listed in the bibliography.

The task of the trainer or trainers is to explain to the volunteers in clear terms how to (and how not to) handle wet or fire damaged books, documents, and other materials, the proper use of the supplies in the emergency kits, and how to air dry materials or pack them for freezing. They must also demonstrate the techniques to be used, and supervise the volunteers in carrying them out. Even thorough verbal instruction is no guarantee that the message has gotten through.

Any on-site training should take place in an area which is not in the way of salvage operations which are already proceeding. The volunteers should receive an overview of the tasks to be performed, and then divide into groups, keeping in mind that some tasks are physically more strenuous than others. For example, one group can be sent with carts to remove wet books from the stacks, and pass the carts off to others who will sort the items to give to still other groups for interleaving or packing for the freezer. It is up to the in-house disaster team to make sure that the workflow is maintained, and that each group understands what its function is. Volunteers should be allowed to switch between groups occasionally after consulting with the trainer, so that they will not become bored. Allow for a break for the workers every two hours or so, and provide them with food and drink and a place to sit down. Be sure that someone records the names and addresses of the volunteers so that they can be thanked afterwards.

### Stabilizing the Environment

- Establish air circulation by using fans, and opening windows and doors if outside humidity is lower than that inside.

- Reduce temperature if possible. Try to maintain a temperature below 70°, if possible.
- Reduce humidity and maintain humidity at a level below 65%.
- Provide electricity if power is out, using portable generators, to run fans, lights, etc.
- Put up plastic sheeting if water is still dripping, to protect the collection from further damage.
- Remove bodies of standing water, and any debris likely to be a safety hazard.
- Remove wet furnishings, draperies, and carpet to lower the humidity in the building.

### **Providing Access to Networked Systems**

If workstations used to access online resources have been affected, attempt to provide access from alternative locations, such as office or home computers, or a Computing Services Department.

Hardware and software recovery specialists within the institution should be identified and designated as having specific duties in the event of an emergency. These are usually the same individuals who administer the network systems and online services. Larger institutions with extensive networks and electronic resources, should designate a manager of recovery operations. This person will evaluate the situation and call in external resources as needed. In smaller institutions, procedures for utilizing the support services of the parent organization and/or external data recovery firms should be *organized and in place prior to an emergency situation*.

### **Sorting Damaged Materials**

- Set up a sorting area in a location convenient to the site of the damage, with as much table space as can be managed. Cover the tables with unprinted newsprint or other absorbent paper.
- Transport the damaged materials to the sorting area by cart, box, or hand, as necessary.
- Separate books and documents which must be frozen from those which can be air-dried.
  - *Good candidates for air drying:*  
Books and documents which are printed on non-coated stock and are only partially wet, or damp; books with velum covers (these need to be dried slowly under controlled conditions – consult a conservator); books with leather covers from the 15<sup>th</sup> to the 18<sup>th</sup> centuries (also need to be dried slowly under controlled conditions).

– *Good candidates for freezing:*

Books and documents which are substantially or completely wet; books and documents containing coated paper; books and documents on groundwood paper; materials with water-soluble media (inks, dyes, watercolors, etc.); books with 19<sup>th</sup> and early 20<sup>th</sup> century leather covers.

- Decide if computers and software are salvageable or not. Remove ruined ones and clean and/or repair damaged but salvageable ones. Clean and check out hardware.
- Separate damaged but salvageable photographic and microform material from others. They require specialized treatment.

## **SALVAGE TECHNIQUES**

### **Freezing**

Freezing is considered to be the safest method of stabilizing wet library and archival materials; books and documents can be frozen indefinitely without harm. The best results are obtained by lowering the storage temperature to -20°F or below. One concern about freezing is the formation of ice crystals within the materials during the freezing process. This can be alleviated by “blast freezing,” or dropping the temperature very rapidly to the recommended level.

Freezing has many advantages. Most importantly, the institution gains time to make repairs to the building, establish environmental control, clean the affected stack areas, and make rational decisions concerning rehabilitation of the materials. Freezing prevents further swelling and warping of wet paper and bindings, and keeps water-soluble inks and dyes from running. It reduces staining and smoke odor. It will keep wet coated paper from sticking together; books on coated stock which have been stabilized by freezing and then freeze-dried can often be completely salvaged. Freezing will not kill mold spores, but it will prevent them from spreading and growing. It has also been used successfully in dealing with insect infestations. For names and telephone numbers of companies which freeze damaged materials, consult the Services Directory in Part 7.

### **Packing Books for Freezing**

- Assemble milk crates, or sturdy cardboard boxes such as standard record storage boxes (about 12x15x10” in size) and wax paper, freezer paper, parchment or silicone release paper.
- Wrap a sheet of paper loosely around each book, leaving the edges open. Do not seal the books in the paper, since sealing slows the evaporation of water. If there are large numbers of books to be packed, then wrap every other book.
- Place books one at a time in the boxes or crates, in a single layer with the spines facing down. Support each book firmly on either side to prevent further swelling. Do not place more books on top of them, since wet books are very heavy, and would crush the materials underneath them. The books on top

would also warp themselves because they would not be evenly supported by the row of volumes below.

- Label the box or crate as to its contents, either by call numbers or by range, section, and shelf designations. Keep a list of what is in each box.
- Stack the boxes on a wooden pallet if possible, and secure them to it for transport to the freezer facility. If the scale of the disaster is small to moderate, then load the boxes individually into the transport vehicles, or secure them to a pallet.

### **Packing Flat Documents for Freezing**

- Assemble milk crates or sturdy boxes such as standard record storage boxes.
- Do not remove documents from their folders for freezing. Place the folders upright in the crates or boxes, making sure that the materials are firmly supported.
- Loose documents, or those which have become separated from their folders may be piled flat in the boxes. Fill the space between the piles of documents and the sides of the box loosely with crumpled unprinted newsprint or paper towels to prevent the contents shifting when the boxes are moved. Do not attempt to separate wet documents since wet paper tears very easily.
- Records which are stored in boxes may be frozen box and all. It is also possible to freeze entire file drawers removed from cabinets. This process saves handling and reduces identification problems, but can pose a problem because of weight.
- Label all boxes or other containers and keep records of what is in each box.

### **Air Drying**

#### **Books**

- Establish clear aisles, good air circulation, and preferably a low temperature in the space to be used for drying. Keep the air moving and the temperature low during the entire drying process.
- Cover drying tables with clean, absorbent paper such as unprinted newsprint or white blotter paper. To prevent damage to the table surface, place a layer of plastic sheeting beneath the paper.
- Do not attempt to open wet books. Stand them on the tables upside down (i.e. on their top edges) until they are dry enough that their pages begin to separate by themselves; they may then be interleaved to help absorb the rest of the water. Change the paper underneath them as often as it becomes wet, and remove the wet paper from the room to reduce the amount of moisture in the

air.

- Cut interleaving paper in a few standard sizes. The interleaving sheets used for any book should be slightly larger than its pages. Paper towels are fine, but the roll type or those folded in half are preferable to those folded in thirds.
- Interleave damp or partially wet pages with newsprint or paper towels, unless the pages are on coated stock, which may stick to the interleaving as it dries. It is preferable to interleave coated pages with sheets of silicone release paper, parchment or wax paper, but newsprint is better than nothing. Do not use silicone release paper and wax paper to interleave non-coated pages since these papers are not very absorbent, and will slow down the drying process of the pages.
- Open the books very carefully and insert an interleaving sheet every ten pages or so, but do not use more interleaving paper than would be about a third as thick as the book, or the spine may become distorted by the extra bulk. Books printed on coated paper should have interleaving sheets placed between each wet page and the ones next to it, or they will stick together on drying. The interleaving sheets should be placed as far into the book as possible without forcing it open, and should not extend below the bottom edge, or the book will not stand upright. Stand the book upright on the drying table with the covers opened enough to support it and fan the pages open carefully. Books which cannot support themselves can often be supported by other volumes.
- Change the interleaving sheets as often as they become wet, placing the fresh sheets into new openings of the text block when possible. Remove wet interleaving sheets from the drying area in a plastic garbage bag in order to reduce the amount of moisture in the air. Interleaving sheets may be dried and reused if they are not soiled.
- When it appears that no more moisture is being absorbed by the interleaving paper, it can be dispensed with, but the books will still not be completely dry. Leave the books in the drying area, upright and fanned open, with the air circulating and the temperature low, for several days at least. It is better to leave them open for a week, if possible. All of the books should be checked periodically for signs of mold growth. Any books which are suspected to be infested should be isolated, so that the mold will not spread to other books.
- Damp or partially wet books whose spines have become concave due to the swelling of the pages may be dried on short lengths of sturdy fish line, to help bring the spines back to their proper shape. If the books are too wet, this procedure is likely to cause damage due to their weight, so they should first be placed upright on the drying tables until most of the water has drained out of them. Tie the drying lines tightly to reduce the amount they will sag under the weight of the books. Use one line for thin books, and two or three for thicker volumes. Open the book fully and place it carefully over the line or lines, trying not to catch and crease any of the pages. As the book becomes drier, fan the pages open occasionally.
- Once the books are dry, an attempt may be made to flatten them by placing them under weights or in a book press. If weights are to be used, there should be a board placed on top of the book first, to distribute the weight evenly. It is usually not possible to flatten the books completely, however; they will probably never regain their original shape.

## **Air Drying Flat Documents**

- Establish clear aisles, good air circulation, and preferably a low temperature in the space to be used for drying. Keep the air moving and the temperature low during the entire drying process. To prevent documents from blowing away, aim fans into the air and not directly at the documents to be dried.
- Lay out single pages on a clean, flat surface covered with absorbent paper such as unprinted newsprint, paper towels, or white blotter paper. Change wet newsprint, etc. to help reduce the amount of moisture in the air.
- If materials are to be dried outside, keep them away from direct sunlight, which can fade inks and accelerate the aging of paper. Provide a clean surface on which to spread out the wet materials, and be careful not to let them be blown away by breezes. Drying materials outside in polluted urban areas is not recommended.
- Do not attempt to separate wet sheets of paper, since this is very likely to cause damage. It should only be done if the records are on coated stock, which will stick to whatever is next to it. This process is very tricky and tedious. The procedure suggested by Buchanan and others to separate sheets of coated paper is as follows: Place a piece of polyester film on the top sheet of stack of records, and rub it down gently. Slowly lift the film, while at the same time peeling off the top sheet. Hang the polyester film on a clothesline using clothespins. As the record dries, it will lift itself from the surface of the film. Before it falls off, remove it and allow it to finish drying on a flat surface. Repeat the lifting process until all the coated paper is separated. It would be wise to practice this technique ahead of time.
- Records that are not printed on coated paper may be placed on the drying tables in piles. Remove the top sheets as they become dry enough to separate them from the other documents, until the whole pile can be laid out as single sheets. Check the piles of documents periodically for signs of mold growth.
- Rehouse dried documents in new folders and boxes. Do not reuse storage materials which have been wet, since they will be more susceptible to attacks by mold than materials which have not been damaged. Dried records will occupy more space than they did before they were wet, and may never regain their original appearance.

## **Salvaging Photographic Materials**

Do not allow wet photographic materials to dry before they can be processed. Immerse them in plastic containers filled with clean, cold water (below 65°F.) until they can be handled either by professionals or in-house. Black and white negative film and prints can be kept in water for up to three days, but no longer, according to Peter Waters, or the emulsion will separate from the film backing. Color slides, negatives, and films must be processed within 48 hours or the colored layers will separate, and the dyes begin to be lost. If the materials cannot be dried properly within the time limits given above, freeze them until they can receive appropriate treatment. Recent research indicates that freezing apparently does not harm photographic materials, but freeze drying can cause

further damage, and should be considered as an option only for photograph albums with captions of artifactual value. Photographs should be frozen in the same manner as books and documents, with the temperature quickly lowered to at least -20°F.

Ideally, all water-damaged photographic materials, including black and white prints, color prints, slides, glass plate negatives, and exposed film, should be treated by professionals. This is not always possible, but there are some steps that may be taken in-house to minimize losses.

### ***Photographic Prints***

- Place the prints in a tray filled with cold water. Agitate the tray gently, and change the water several times. Avoid sudden changes in the temperature of the water. Never use warm water.
- Rinse black and white prints for about half an hour, color prints for less time, then drain them and hang them to dry on a clothesline, or dry on a flat clean surface. Do not attempt to flatten them.

### ***Processed Films, Negatives and Slides***

- Immerse the materials in cold water containing 15 ml of a 37% formalin solution per liter of water. The formalin helps to harden the gelatin in the emulsion layer.
- Separate the materials from each other and from any enclosures or sleeves. Remove enclosure material from the water. Very carefully swab any dirt from the surface of the film; do not overdo this, since the softened gelatin layer will be very vulnerable to damage. Rubber gloves are advisable for this operation.
- After 15 to 30 minutes, depending on the amount of dirt to be removed, take the materials out of the water, drain them, and dry them on a clean, flat surface with their emulsion sides up.

### ***Nitrate and Glass Plate Negatives***

- Give priority in processing to nitrate and glass plate negatives, which are likely to have softer gelatin than those on safety film. Nitrates may be cleaned and dried in the manner described above.
- Glass plate negatives may also be cleaned and dried in the same way as safety negatives, but if they are stuck to each other, freeze them and refer them to a photographic conservator. This is not an uncommon occurrence, since glass plate negatives are likely to be stored in boxes without envelopes or interleaving. Collodion glass plate negatives are very water-soluble, and cannot stand immersion for more than 24 hours. They should never be freeze dried. Glass plates are also heavy and breakable, and must be handled with great care.

### ***Air Drying of Slides***

Slides that are wet but not dirty have been successfully air-dried with little handling besides replacing warped paper mounts with snap-on plastic ones where necessary. Place the slides emulsion side up on a clean flat surface, or hang them carefully by their edges from a line using clothespins. Keep any mounts that are removed next to the image portions of the slides until the new mounts can be applied and labeled. The plastic mounts selected for this purpose must be chemically stable, however. They must not be made of PVC (polyvinyl chloride), which gives off harmful chemicals as it ages.

## **Salvaging Magnetic and Electronic Media**

### ***Laser Optical Media***

CDs, DVDs, CD-ROMs, and laser video discs that have mud and sewage on them can be washed in a detergent solution. Do not rub the discs because dirt could scratch the tracks. Rinse discs thoroughly in distilled water. Then air dry on supports that permit free circulation of air. CD formats tend to be less sensitive to moisture than magnetic media, but they are sensitive to heat (fire or catastrophic failure of HVAC system) and must be cleaned thoroughly before attempting playback in the event that they are wet with anything other than distilled water. Small deposits on the surface of a disc can cause loss or loss of access to information. Discs can be blotted off with a soft lint-free cloth. Always use a radial not circular motion going from the center of the disk out to its edge.

### ***Magnetic Tape (Audio, Video)***

Smoke damaged magnetic tape may often be salvaged merely by cleaning the exposed surfaces with water, allowing the tape to dry, and then fast-winding the tape against a felt pad (without the tape contacting the heads). Re-record the tape onto a new tape.

Wet magnetic tape may be impossible to reclaim, since prolonged exposure to water can cause chemicals to leach out. It is usually less trouble simply to discard a damaged tape if there is a backup available.

Slightly wet magnetic tape may be cleaned with water, air dried, and rewound at fast speed against a felt pad. Cassettes pose a problem, because the tape is encased in plastic containers that are not designed to be opened. If the tape must be saved, open the cassette and clean as with other magnetic tapes.

Re-record the cleaned and dried tapes onto new tapes; the original may be either saved or discarded.

### ***Floppy Disk (3 ½ inch) and Zip Disk Media***

Open the 3 ½ plastic diskette housing by breaking the plastic welds at the back edge of the diskette (opposite the aluminum shutter) and pry open the corners using a fingernail, knife, or screwdriver. Take care when using sharp objects to avoid damaging the media disk. Remove the disk medium using a gloved hand.

Nylon and cotton gloves are preferred over rubber due to the potential for transferring oils to the disk. DO NOT use bare hands.

To remove dust or surface dirt, carefully use compressed air. Salt, mineral and grease deposits may be removed with a clean cotton cloth dampened with water. If this does not remove the deposits, use very mild soapy water. Use extreme caution not to wrinkle or crease the disk medium.

Once the disk medium is clean, place it in a new diskette housing. Remove the diskette medium from a new diskette in the same manner as above to obtain the new housing. Use extra caution when prying open the housing so as not to damage the aluminum shutter. The recovered diskette should be copied immediately to a new diskette or to a working hard drive. Some software is available if the data are unrecoverable in this manner. Use head cleaning kits periodically, in order to ensure no debris have transferred to the computer's floppy drive. Once the diskette's information has been verified as retrieved, discard or archive the damaged diskettes.

Zip disks and their risk media are treated in the same manner as 3 ½ floppy diskettes. The only difference is that the housing of a zip disk is much stronger and can be easily disassembled by removing the small screws securing it.

### ***Floppy Disk Media (5 ¼ inch)***

Floppy disks which are only slightly wet have been successfully dried by directing a stream of room temperature air (from a hair dryer on "air" setting) inside their plastic sleeves. Hold the sleeve slightly away from the disk, and circulate air through it until both sides of the disk and the sleeve lining are thoroughly dry. Copy it to a new disk.

Disks that are very wet may have to be removed from their sleeves to dry. Cut off the edges of the plastic sleeve, making sure that the disk is positioned away from the edge being cut. Peel the sleeve away from the disk, and blot it dry with a soft cloth. Disks may also be air dried, but should not be handled by their recording surfaces. Pick them up by the rim and the hold in the middle, and hang them or prop them carefully so that the surfaces do not come into contact with anything.

Once dry, each disk may be inserted into the plastic sleeve of a new undamaged disk, which has been cut open at the back edge. The new disk is removed and set aside to be replaced later. Each of the dried disk may then be inserted into the empty sleeve and copied onto a new disk.

## **Salvaging Microforms**

### ***Silver-Gelatin Type Microfilm***

- Keep in clean, cold water.
- Label as wet.
- Ship to microfilm processor within one day.

### ***Diazo Microfiche and Microfilm***

Check for readability. If the film has blistered, discard it. If it has not delaminated, wash in cool water and dry on blotters or a lint-free cloth.

### ***Microfilm and Microfiche in Jackets***

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

## **Salvaging Phonodiscs**

- Deformed and damaged records cannot be salvaged.
- Remove the records from their sleeves and jackets.
- If labels have separated, mark the center of record with a grease pencil and keep track of the label.
- Jackets, sleeves, and labels may be dried like other paper materials.
- If dirt has deposited on the records, wash them in a 10% solution of Kodak Photo Flo in distilled water and rinse well.
- Air dry in vertical position on supports that allow free air circulation.

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# 5. REHABILITATION

## STABILIZING AND MONITORING THE ENVIRONMENT

After a disaster, especially a large-scale one, an institution's primary goals for rehabilitation should be to bring the building's interior conditions within acceptable limits, and to be able to maintain those conditions. Conservation standards for library and archives environments are generally given as 68°F and 50% relative humidity, but it may not be possible to achieve these conditions in an emergency situation (many institutions cannot meet them under normal circumstances). Both the temperature and relative humidity must be kept low if mold growth is to be prevented, but humidity is the key factor. Mold generally prefers conditions of 70°F or above, and 65% relative humidity or higher; however, if the humidity is high enough for a long enough period of time, mold will grow even in cool temperatures.

### HVAC Equipment

It may be necessary after a major disaster to replace or temporarily supplement existing heating, ventilating and air-conditioning (HVAC) equipment in order to meet environmental goals. This may be accomplished through rental or purchase of the equipment, or by contracting with a service company such as those mentioned in the Services section of this manual. Some suppliers of stand-alone HVAC equipment (specifically industrial dehumidifiers) are also listed in that section. Small household dehumidifiers are not recommended except for small, enclosed spaces. For disaster recovery purposes, they are not adequate.

### Monitoring Equipment and Techniques

Monitoring of the environment after a disaster is extremely important in order to determine whether conditions that will sustain mold growth exist, and whether remedial HVAC measures have been effective. There are several types of monitoring equipment that are readily available through specialist (and some library) suppliers. They are designed to measure the temperature and relative humidity (RH) in the air around them, but they function in different ways.

**Hygrothermographs** are stationary instruments that monitor environmental conditions continually, and record the temperature and RH on a weekly or monthly chart. The chart is mounted on a cylinder or a wheel and revolves beneath the recording pens. The chart drive may be spring or battery powered; it and the sensing mechanisms and pens are housed in a case. Hygrothermographs often use an organic component such as a strand of human hair, which will respond to changes of moisture content in the air in a predictable manner, to determine RH. They are relatively accurate instruments, but should be recalibrated with a psychrometer about once a month for best results. They

are also rather expensive, but if monitoring is to be done over an extended period, or if a continuous record is required, there is no substitute.

**Psychrometers** are hand-held instruments that are used for making spot checks of conditions within the stacks or other areas, and for recalibrating stationary equipment. They are generally the most accurate of the humidity measuring devices if used properly, and produce readings quickly. There are three types of psychrometers:

- *Sling psychrometers* are swung by hand to achieve a flow of air over two thermometer bulbs; one of these is covered with a wick that must be saturated in distilled water (the wet bulb). The other, or dry, bulb is not covered. When the readings of both bulbs have stabilized, the temperature is read from the dry bulb, and the RH is calculated by referring both bulb readings to a psychrometric chart, or else a slide rule provided by the manufacturer.
- *Aspirating psychrometers* work in the same manner, except that the two thermometers are mounted in a case, and a battery-powered fan carries the air over the wet and dry bulbs. They are more expensive than the sling variety, but are less tiring to use, and can be used in less space, as they do not have to be swung around. If a large number of readings must be taken, or if many different people will be taking the readings (and thus introducing inaccuracies due to differences in technique), an aspirating psychrometer would be worth the extra cost.
- *Electronic psychrometers* use a thin film sensor rather than thermometers to measure RH. These instruments provide readings almost instantly, and may be used in hard to reach spots, such as behind a row of shelved books. They can be very expensive, and many types are not sufficiently accurate to be used as standards for recalibrating other instruments. Some do come with their own recalibration devices, however.

**Thermohygrometers** (also called hygrothermometers) indicate temperature and relative humidity continuously but do not record it, and so must be visually checked on a regular basis, and the readings written down to obtain a record. They are less accurate than hygrothermographs and not all types may be recalibrated. They are inexpensive, but are usually not satisfactory for long-term monitoring. Thermohygrometers are generally small dial-type instruments for stationary use. Many employ a sensing mechanism, which consists of two papers that react differently to RH glued on top of each other and coiled. Changes in the moisture content of the air cause the coil to twist, which moves the indicator on the dial.

**Moisture Meters**, or RH probes, measure the relative humidity inside an object. They do not measure temperature. These instruments operate on the same principle as electronic psychrometers, and indeed, some are electronic psychrometers with a different sensing probe attached. Flat or "sword" probes may be inserted between the pages of books, or papers in a file to measure the moisture content of the materials. Moisture meters are somewhat specialized equipment, but are very helpful in monitoring the progress of materials that are being dried, either by air or freeze drying, toward their normal moisture content.

**Humidity Indicator Cards** are useful for approximate indications of RH at a glance. They are cards with a strip of chemically impregnated material attached, which changes color in response to changes in atmospheric moisture. They are expensive, and can be useful in determining if the RH of an area is roughly within the desired range.

## **BUILDING REHABILITATION**

The objectives in rehabilitation of the building are first to render it safe and functional. Structural damage must be repaired, debris and dirt cleared away, and collection and office spaces dried out. Any conditions that contributed to the disaster should be attended to, to prevent a recurrence. It is very important that the building's heating, ventilating and air conditioning system be working, in order to maintain control of environmental conditions. Several of the companies listed in this manual offer emergency environmental control and interior drying services and are possible sources of assistance if the work cannot be done in-house or by the institution's normal maintenance and repair contractors.

Another important part of building rehabilitation is cleaning of the collection spaces that have been damaged by water, dirt, soot, or other contaminants. Shelves, which have been wet, should be wiped off with a rag dampened in alcohol or a 10% solution of household bleach in water, to prevent the growth of mold; be careful not to let this drip onto any collection materials still on the shelves. Accumulations of dirt and soot may be vacuumed up, but it should be remembered that most vacuums do not have filters that will trap the finer particles, which will then be blown back out into the air through the exhaust. Treated dust cloths will pick up most of these particles from the shelves and furniture; those which are actually made of cloth can usually be washed and reused several times.

## **COLLECTION REHABILITATION**

After the initial salvage work is completed and the affected parts of the collection are safely dried or frozen, much work will still remain to be done. The damaged materials will need to be cleaned, repaired, rebound, rehoused, and returned to the shelves. Rehabilitation begins with sorting.

### **Sorting and Assigning Priorities**

Much of the work of sorting will have already been done during the salvage phase of response to a disaster. It remains for the institution to decide how many of the frozen materials must be freeze-dried, and how many can be air-dried. For those items that are already dry, there are several possibilities: they can be returned to circulation in their present state; they can be repaired; they can be restored by a conservator; they can be replaced, either in the same format, or an alternate format if such is available; or they can simply be discarded. If funds are limited, some decisions will have to be made concerning what to restore. If computer files and/or equipment are affected, replacement and upgrades need to be determined.

## Treatment of Water-Damaged Materials

### *Freeze drying and vacuum drying*

Freeze drying is well known as a technique for salvage of waterlogged books and documents. Unfortunately, the term “freeze drying” is often mistakenly used to describe other processes as well. There are actually three techniques used for drying materials in a vacuum chamber: vacuum freeze drying, vacuum drying, and thermal vacuum drying.

- *Vacuum freeze-drying* is the safest method for books. It is the only one in which the water in the materials remains frozen throughout the drying process, and is removed without passing through the liquid stage. The water is vaporized at a pressure of 4.58 mm of mercury and a temperature below 32°F. Books that have been properly freeze dried often emerge from the process in much better shape than those that have been air-dried. In vacuum drying, vaporization occurs above 32°F, which means that the wet materials are not frozen, and will continue to react to moisture during drying. Books may warp and cockle, water-soluble adhesives and colors could continue to spread, and coated paper may fuse to surrounding sheets.
- *Vacuum drying* is cheaper than vacuum freeze drying, and may be suitable for office files and materials not of permanent research value.
- *Thermal vacuum drying* is the least desirable alternative, and is not offered by any of the services listed in this manual. This process uses a thermal cycle in which the books are periodically warmed by the introduction of heated nitrogen to the vacuum chamber. This subjects them to a very hot environment, and causes the ice in the materials to melt, thus allowing the moisture reactions described above. The thermal cycling, which may be repeated seven to ten times in as many days, can also be very stressful to cellulosic materials.

### *Air drying*

Frozen books and documents can be thawed and air-dried, as an alternative to freeze drying if funds are limited. When books are removed from the freezer, they should be kept in their boxes, and allowed to thaw for 24 hours in an area of low humidity. This will help to prevent atmospheric moisture from condensing on their covers. Both books and piles of documents must be allowed to thaw completely before separating sheets from each other. Great damage will be caused by attempts to force frozen materials open or apart.

### *Treatment of mold and mildew*

The first step in controlling an infestation of mold is always to bring the storage environment under control. Lower the temperature and relative humidity and increase air circulation. Isolate any materials that show signs of mold growth from the rest of the collection so that the spores will not spread to other items. Seal the affected materials in zip-lock type polyethylene bags.

Small growths of mold can usually be removed from book covers by wiping them off with a soft cloth dampened with alcohol. This kills the mold spores, and also

wets them so that any left living will not be brushed off to settle on other books. Any use of alcohol or other solvents is best done in a fume hood or outside if weather conditions permit. Alcohol may dissolve some dyes in book cloths, so it must be used with caution.

Leaving books outside in the sunlight reduces the musty odor of mold, but is not recommended for items of permanent research value, due to the dangers of exposure to ultraviolet light. If there is more than a little mold, it can be removed with a wet/dry vacuum cleaner, with a 10% solution of bleach in the water in the tank. This is to keep the spores from simply being blown back out into the air through the exhaust. The covers should then be wiped with an alcohol-dampened rag. Fumigation is only to be considered as a last resort, due to the toxicity of the chemicals used, and the possibility of damage to the materials from the chemical residues. If fumigation must be done, it should only be attempted with the advice of a conservator.

## **Treatment of Fire-Damaged Materials**

There is little that can be done with materials that have been burned, though in some cases partial salvage is possible. Burned materials, especially paper, are very fragile, and can easily be destroyed completely by careless handling. They should be carefully placed between sheets of cardboard cut slightly larger than the materials to be protected, and wrapped in paper or plastic (sometimes a zip-lock bag will do), and referred to a conservator. Replacement is generally the most satisfactory method of dealing with the problem, but if the material is irreplaceable, it may sometimes be reproduced photographically or xerographically. Some single sheet items can be encapsulated for protection. Books with adequate margins can sometimes be rebound with their charred edges trimmed off.

## **Cleaning**

### ***Surface deposits and stains***

The success of cleaning efforts will depend on what was in the water. If floodwaters have deposited mud on the collection, this can be brushed off when the books are dry. Surface deposits, which cannot be completely removed by brushing, may sometimes be cleaned by use of white vinyl erasers, used gently and carefully. For large surfaces or fragile paper, the erasers may be grated into fine crumbs with a cheese grater and rubbed gently over the soiled area with the fingers. Eraser crumbs must always be brushed off completely. There is no guarantee that the materials themselves may also leave dark "tide lines" on paper that has been partially wet. Some stains can be removed by washing the paper, but this is a task requiring skill and expertise, and should be referred to a conservator if the item is valuable enough to warrant such treatment. Soiled photographic materials should also receive professional treatment if they have artifactual value and cannot be copied.

### ***Smoke and soot removal***

Smoke and soot damage is difficult to undo, but may be lessened in some cases if the material is not actually charred. Generally, the most that can be done is to

remove soot from surfaces; soot stains are usually permanent. Several types of chemical sponges are available which absorb surface particles, and are applied to the materials with a dabbing motion. Although there is some question as to whether they leave a residue, their use may be preferable to brushing, which could cause smears and stains. Removable hard disk platters exposed to smoke often have particulate matter on the surface that must be professionally cleaned prior to activation. Disk read/write heads are subject to severe damage if an attempt is made to operate with media which is not clean. A "head crash" caused by particulate matter on the surface of the hard disk media will not only damage the drive, but may cause loss of data.

## **Repair and Rebinding**

Minor damage to materials can often be repaired in-house, especially if there is already a mending operation. This might include repairing torn pages with Japanese tissue and starch paste, reattaching detached covers, and flattening warped or cockled items (though it must be remembered that most air-dried bound volumes will not regain their original appearance). Commercial library binders can recase or rebind books that are not too badly warped. Very swollen or distorted books and loose issues of periodicals may not be suitable for commercial binding because they will not go through the mechanized binding processes smoothly and are difficult to handle.

## **Relative Recovery Costs of Different Options**

Contrary to popular belief, it is almost always less expensive to repair library materials than to replace them. This situation is largely due to staff costs for locating, purchasing, and processing the replacements. Treatments such as freeze-drying may seem expensive at first as well, but can be worth the cost in terms of the savings in repair and replacement of materials. Choices should be made in light of the treatment objectives for the item: does it merely need to be useable, or does it merit special attention; should the original format be saved, or is only the information content important; and will important features be destroyed by too much repair? For items which must be preserved in as near their original condition as possible, and for which there is not money available for professional conservation treatment (which can be very expensive), one alternative is simply to place it in an appropriate enclosure, such as a drop-spine box. It must always be remembered, however, that cost is not the only consideration; saving money on a treatment option can be a hollow victory if the desired results are not achieved.

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## 6. BIBLIOGRAPHY

**Planning**  
**Prevention and Preparedness**  
**Fire Prevention and Protection**  
**Salvage**  
**Microforms**  
**Photographic Materials**  
**Computer Networks and Media (Electronic and Magnetic)**  
**Magnetic Media (Audio and Video)**  
**Freezing and Freeze-Drying**  
**Mold and Insects**  
**Disaster Planning Metasites**

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### PLANNING

Alire, Camila, ed. *Library Disaster Planning and Recovery Handbook*. New York: Neal-Schuman, 2000.

Ashman, John. *Disaster Planning for Library and Information Services*. London: Aslib, 1995.

Barton, John and J. Wellheiser, eds. *An Ounce of Prevention: A Handbook on Disaster Contingency Planning For Archives, Libraries, and Record Centres*. Toronto: Toronto Area Archivists Group, 1985.

Brown, Karen E. *Emergency Management Bibliography*. (NEDCC Technical Leaflet, Emergency Management, Sect.3, Leaflet 5.) 1999, 2003. (Accessed Sept. 2003) URL: <http://www.nedcc.org/plam3/tleaf35.htm>

Buchanan, Sally. *Disaster Planning: Preparedness and Recovery for Libraries and Archives*. Paris: General Information Programme and UNISIST, United Nations Educational, Scientific and Cultural Organization, 1988.

Coleman, Christopher. *Practical Large-Scale Disaster Planning*. [San Marino, CA] : Society of California Archivists, 1992.

Cox, Richard J. *Flowers After the Funeral : Reflections on the Post-9/11 Digital Age*. Lanham, Md. : Scarecrow Press, 2003.

Eng, Sidney. "How Technology and Planning Saved My Library at Ground Zero." *Computers in Libraries* 22, no. 4 (April 2002) : 28-35.

- Eulenberg, J.N. "Disaster Recovery Planning for the Corporate Archives." *Corporate Archives and History*. Eds. Arnita A. Jones and Philip L. Cantelon. Malabar, FL : Krieger Pub., 1993.
- Fortson, Judith. *Disaster Planning and Recovery: A How-To-Do It Manual for Librarians and Archivists*. New York: Neal-Schuman, 1992.
- Fortson, Judith. "How to Develop a Disaster Plan for Books and Records Depositories." *History News* 38, no.5 (1983) : 30-31.
- Fox, Lisa L. *Workbook For Developing a Disaster Plan*. [Richmond, VA] : Library of Virginia, Records Management and Imaging Services Division, 1996.
- George, Susan C., comp. *Emergency Planning and Management in College Libraries*. Chicago, IL : Association of College and Research Libraries, 1994.
- Haines, Jan. *A Disaster Preparedness Plan For Small Public Libraries, 2002*. Columbus, Ohio : State Library of Ohio, 2002.
- Kahn, Miriam. "Mastering Disaster: Emergency Planning for Libraries." *Library Journal* (December 1993) : 73-75.
- Langelier, Gilles and Sandra Wright. "Contingency Planning for Cartographic Archives." *Archivaria* 13 (Winter 1981/82) : 47-58.
- Lawrence, Deirdre and Susan Schwartzburg. "Emergency Plan for Art Libraries." *Art Documentation* (Summer 1984) : 58-60.
- Matthews, Graham and John Feather. *Disaster Management For Libraries and Archives*. Aldershot, Hants, England ; Burlington, VT : Ashgate Pub., 2003.
- McColgin, Michael and Linda Slusar. *Disaster Planning*. (videocassette ) Chicago : American Library Association, 2000.
- Miller, R.B. "Contingency Planning Resources [Disaster Prevention and Recovery]." *Information Technology and Libraries* 9 (June 1990) : 179-80.
- Muir, A., et. al. "If the Worst Happens: The Use and Effectiveness of Disaster Plans in Libraries and Archives." *Library Management* 23, no. 3 (2002) : 115-23.
- Mullin, C.G. "Planning for Disaster: Some Ideas About Where to Begin." *PNLA Quarterly* 60 (Spring 1996) : 11-12.
- Murray, Toby. *Basic Guidelines For Disaster Planning*. Springfield, IL : Illinois State Library, Preservation Office, 1990.
- Neal, Nancy. *School Library Media Center Disaster Response Plan Handbook*. [Canton, Ill.] : ISLMA, 1994.
- O'Connell, Mildred. "Disaster Planning: Writing & Implementing Plans for Collections-Holding Institutions." *Technology and Conservation* 2 (Summer 1983) : 18-24.
- Ogden, Sherelyn. *Preservation Planning: Guidelines For Writing a Long-Range Plan*. Washington, D.C., Andover, Mass. : American Association of Museums, Northeast Document Conservation Center, 1997.

Patkus, Beth Lindblom and Karen Motylewski. *Disaster Planning*. (NEDCC Technical Leaflet, Emergency Management, Sect.3, Leaflet 3.) 1999. (Accessed Sept. 2003) URL: <http://www.nedcc.org/plam3/tleaf33.htm>.

Rightmyer, S.P. "Disaster Planning; or, The "What Next" Attitude" [special issue]. *New Jersey Libraries* 28 (Summer 1995) : 3-18.

Russell, Ann. "Introduction to Disaster Planning and Recovery." *The Book and Paper Group Annual* 5 (1986) : 129-38.

Rutherford, C. "Disaster Planning, Preparation, Prevention [Every Public Library Should Have a Written Disaster Plan]." *Public Libraries* 29 (September/October 1990) : 271-6.

Skepastianu, Maria and Jean Whiffin. *Library Disaster Planning*. The Hague : International Federation of Library Associations and Institutions, 1995.

Vriend, Anita. "Creating Guidelines For Disaster Planning." *Art Libraries Journal* 27, no. 1 (2002) : 27-30.

Wellheiser, Johanna G. and Jude Scott. *An Ounce of Prevention : Integrated Disaster Planning For Archives, Libraries, and Record Centres*. 2<sup>nd</sup> ed. Lanham, Md. ; Toronto, Ont. : Scarecrow Press ; Canadian Archives Foundation, 2002.

Wood, L. "1000 Easy Steps Toward Developing a Disaster Recovery Plan; or, The Boss Must Like Me Because He Gave Me the Job of Writing the Disaster Plan." *Conservation Administration News* no. 58-59 (July/October 1994) : 16-20.

"Writing the Disaster Response Plan." *Proceedings of the 2000 Federal Depository Library Conference*. (Last accessed Sept. 19, 2003) URL: [http://www.access.gpo.gov/su\\_docs/fdlp/pubs/proceedings/00pro28.html](http://www.access.gpo.gov/su_docs/fdlp/pubs/proceedings/00pro28.html)

---

## PREVENTION AND PREPAREDNESS

Association of Research Libraries, Office of Management Services. *Insuring Library Collections and Buildings*. (SPEC Kit 178.) Washington, D.C. : ARL, 1991.

Association of Research Libraries, Office of Management Services. *Preparing for Emergencies and Disasters*. (Systems and Procedures Exchange Center SPEC Kit No. 69.) Washington, D.C. : ARL, 1989.

Baker, Whitney. "Preservation Perspectives: Preparing for the Imminent: Protecting Your Collections From a Disaster." *Kentucky Libraries* 66, no. 2 (Spring 2002) : 18-19.

Brooks, Constance and Pamela W. Darling. *Disaster Preparedness*. Washington, DC : Association of Research Libraries, 1993.

Buchanan, Sally. "Disaster Prevention, Preparedness, and Action." *Library Trends* 30 (Fall 1981) : 241-52.

- Buchanan, Sally. "Preservation Management: Emergency Preparedness." *Preservation: Issues and Planning*. Chicago, IL: American Library Association, 2000.
- CLA Earthquake Relief Grand AdHoc Committee. *Earthquake Preparedness Manual for California Libraries*. Sacramento : California Library Association, 1990.
- Champion, Sandra and Christine Master. "When Disaster Strikes." *School Library Journal*, 39 Iss. 9, (September 1993) : 146-149.
- DiMattia, S. S. "Planning for Continuity [disaster plans]." *Library Journal* 1976, v. 126, no. 19 (November 15, 2001) : 32-4.
- Disaster Preparedness*. Washington, D.C.: Government Printing Office, 1972.
- Disaster Prevention and Preparedness* (A Problems in Archives Kit: Pak 10) Chicago : Society of American Archivists, 1982.
- Fierro, Eduardo A. *Reducing the Risks of Nonstructural Earthquake Damage: A Practical Guide*. 3<sup>rd</sup> ed. Washington, D.C. : FEMA, 1994.
- Fischer, David J. and Thomas W. Duncan. "Conservation Research: Flood-Damaged Library Materials." *Bulletin of the AIC* 15, no. 2 (Summer 1975) : 27-48.
- Fox, Lisa L. *Disaster Preparedness Workbook For U.S. Navy Libraries and Archives*. Newport, R.I. : The Library, 1998.
- Fox, Lisa L. "Management Strategies for Disaster Preparedness." *The ALA Yearbook of Library and Information Services* 14 (1989) : 1-6.
- Ginell, William S. "Making It Quake Proof." *Museum News* 69, no. 3 (May/June 1990):60-63.
- Higginbotham, Barbra Buckner. "Practical Preservation Practice: Before Disaster Strikes, Be Prepared." *Technicalities* 15, no.7 (July 1995) : 4-5.
- Higginbotham, Barbra Buckner, and Miriam B. Kahn. "Disasters for Directors: The Role of the Library or Archives Director in Disaster Preparedness and Recovery." In *Advances in Preservation and Access, Vol. 2*, ed. Barbra Buckner Higginbotham. Medford, NJ : Learned Information, Inc., 1995 : 400-12.
- Hunter, John E. *Emergency Preparedness for Museums, Historic Sites and Archives: An Annotated Bibliography*. Lincoln, NE: National Park Service, 1981.
- Johnson, Linda B. and Jeff Paul. "Coping with a Quake." *College & Research Libraries News* 5, no. 10 (Nov. 1990) : 928-933.
- Kahn, Miriam B. *Disaster Prevention and Response for Special Libraries: An Information Kit*. Washington, D.C. : Special Libraries Association, 1995.
- Kahn, Miriam B. *Disaster Response and Planning for Libraries*. 2<sup>nd</sup> ed. Chicago : American Library Association, 2003.

Layne, Stevan P. and Leigh S. Estabrook. *Preparing Your Library For Disaster*. (sound recording) [Chicago, Ill.] : [Palm Desert, Calif.] : Public Library Association; Produced and distributed by Teach'em Continuing Education, 2002.

Lederer, Naomi and Douglas J. Ernest. "Managing the Media During a Library Crisis." *American Libraries*, 33, Iss. 11, (December 2002): 32-35.

Merritt, T. "Insuring and Protecting Your Library's Collections. *Kentucky Libraries*, 65, no. 4 (Fall 2001) : 13-18.

Murray, Toby, comp. *Bibliography on Disasters, Disaster Preparedness and Disaster Recovery*. Tulsa, OK: University of Tulsa, 1994.

Myers, Gerald E. *Insurance Manual for Libraries*. Chicago: American Library Association, 1977.

Myers, James N. and Denise D. Bedford, Eds. *Disasters: Prevention and Coping*. Stanford : Stanford University Libraries, 1981.

Morris, John. *The Library Disaster Preparedness Handbook*. Chicago: American Library Association, 1990.

Page, J.A. "When Disaster Strikes: First Steps in Disaster Preparedness" [presented at the 1998 NASIG Conference]. *The Serials Librarian* 36, no. 3-4 (1999) : 347-61.

*A Primer on Disaster Preparedness, Management and Response: Paper-Based Materials*. Selected Reprints issued by Smithsonian Institution, National Archives and Records Administration, Library of Congress and National Parks Service. Washington, D.C., 1993.

"Response and Recovery", *FEMA.gov : Federal Emergency Management Agency*. (Accessed Sept. 2003.) URL: <http://www.fema.gov/rrr/>

Sable, Martin H. "VII, Insurance." *Library & Archival Security* 5, Nos. 2-3 (1983) : 59-60.

Schur, Susan E. "Disaster Prevention, Response, and Recovery: A Selected Bibliography." *Technology & Conservation* (Summer 1994) : 21-23, and (Fall 1995) : 23-34.

Seal, Robert A. "Insurance for Libraries: Parts I and II." *Conservation Administration News* 19 (December 1984) : 8-9; and 20 (January 1985) : 10-22, 26.

Shelton, John A. *Seismic Safety Standards for Library Shelving*. Sacramento : California State Library Foundation, 1990.

Schink, M.L. "Selecting Disaster Recovery Software." *Colorado Libraries* 25, no. 1 (Spring 1999) : 38-9.

Shuman, Bruce A. *Library Security and Safety Handbook: Prevention, Policies, and Procedures*. Chicago : American Library Association, 1999.

Smith, Scott. "Insurance Planning." *History News* 48, no. 1 (Jan./Feb. 1993) : 18-19, 37.

Strassberg, Richard. *Conservation, Safety, Security and Disaster Considerations in Designing New or Renovated Library Facilities at Cornell University Libraries*. Ithaca, NY : Cornell University Libraries, 1984.

Streit, Samuel. "Antediluvian Considerations: The Library Structure and Disaster Prevention." *Conservation Administration News* 11 (October 1982) : 3-5.

Walch, Timothy, "Security Against Fire and Flood." *Archives and Manuscripts Security*. Basic Manual Series. Chicago: Society of American Archivists (1977) : 14-18.

Weber, David C. *Library Buildings and the Loma Prieta Earthquake Experience of October 1989*. Sacramento: California State Library Foundation, 1990.

Whittow, John. *Disasters: The Anatomy of Environmental Hazards*. London: Allen Lane, 1980.

Young, Richard F. *Library and Archival Disaster--Preparedness and Recovery : Manual--Workbook*. [Oakton, Va.] : BiblioTech, 1986.

Young, Richard F. and David J. Tinsley. *Library & Archival Disaster Preparedness & Recovery*. (videorecording) Chicago, IL : ALA Video, 1986.

---

## FIRE PREVENTION AND PROTECTION

Artim, Nick. *An Introduction to Fire Detection, Alarm and Automatic Fire Sprinklers*. (Technical Leaflet: Emergency Management, Sect. 3, Leaflet 2.) Andover, MA : NEDCC, 1999, 2003. (Accessed Sept. 19, 2003) URL: <http://www.nedcc.org/plam3/tleaf32.htm>.

Bailey, J. Russell. *Building Code Requirements and Life Safety Equipment For Library Buildings : Background Information on a Presentation to the American Library Association, Library Conference Program, San Francisco, June 30, 1981*. Orange, Va. : Bailey and Gardner, Architects, 1981.

Chicarello, Peter, et al. *Fire Tests on Mobile Storage Systems for Archival Storage*. Norwood : Factory Mutual Research, 1978.

Colonna, Guy R. *Introduction to Employee Fire and Life Safety*. Quincy, Mass. : National Fire Protection Association, 2001.

Egesdal, S.E. "The Basics of Fire Alarm Systems." *Security Management* 24, no. 7 (July 1980) : 58-61.

*Fire Prevention and Fire Engineers Journal*. London : Fire Protection Association, Institution of Fire Engineers, 2002-

The Fire Protection Association. *Library of Fire Safety*. (CD-ROM.) [London, England] : The Association, c2003.

*Fire Protection Handbook*. 19th ed. Arthur E. Cote, ed. Quincy, Mass. : National Fire Protection Association, 2003.

Harvey, Bruce. " Fire Hazards in Libraries" [Part I-IV] *Library Security Newsletter* 1, no. 1 (1975) : 6-7; no. 2 : 1, 4-5; no. 3 : 9-10; no. 4 : 1, 5; no. 5 : 12-13; no. 6 : 10-11.

Morris, John. *Managing the Library Fire Risk*. 2nd ed. Berkeley: University of California, 1979.

Morris, John. "Protecting the Library from Fire." *Library Trends* 33 (Summer 1984) : 49-56.

National Fire Protection Association. *Archives and Records Centers*. (NFPA 232AM) Quincy, MA: National Fire Protection Association, 1991

\_\_\_\_\_. *Extinguishers, Portable*. (NFPA 10) Quincy: MA : National Fire Protection Association, 1990.

\_\_\_\_\_. *Fire Prevention Code*. (NFPA 1) Quincy, MA : National Fire Protection Association, 1987-

\_\_\_\_\_. *Fire Protection Handbook*. Boston, Mass. : National Fire Protection Association, 1962-

\_\_\_\_\_. *Libraries and Library Collections*. (NFPA 910) Quincy, MA : National Fire Protection Association, 1991.

\_\_\_\_\_. *Museums and Museum Collections*. (NFPA 911) Quincy, MA : National Fire Protection Association, 1991.

\_\_\_\_\_. *Protection of Records*. (NFPA 232) Quincy, MA : National Fire Protection Association, 1991.

*NFPA Guide to Portable Fire Extinguishers*. Mark T. Conroy, ed. Quincy, Mass. : National Fire Protection Association, 2003.

*NFPA Journal. Buyers' guide : Fire Protection, Fire Safety and Equipment Services*. Quincy, MA : The Association, 1999-

Roberts, Barbara, et al. "An Account of the Conservation and Preservation Procedures Following a Fire at the Huntington Library and Art Gallery." *Journal of the American Institute for Conservation* 27, no. 1 (Spring 1988) :1-31.

Shepilova, Irina G. *Main Principles of Fire Protection in Libraries and Archives : A RAMP Study / Paris : General Information Programme and UNISIST, United Nations Educational Scientific and Cultural Organization, 1992.*

Welch, J.T. "The Fire Next Time: Disaster Planning & Recovery." *North Carolina Libraries* 58, no. 3 (Fall 2000) : 48-73.

Wilson, J. Andres. "Library and Archive Fire Protection: A Primer." In *Preservation of Library and Archival Materials*, edited by Fran Pflieger. Alexandria: Association of Higher Education Facilities Officers, 1991.

---

## SALVAGE

Buchanan, Sally. "Disaster Prevention, Preparedness, and Action." *Library Trends* 30 (Fall 1981) : 241-52.

Buchanan, Sally. *Emergency Salvage of Wet Books and Records*. (Technical Leaflet: Emergency Management, Sect. 3, Leaflet 7.) Andover, MA : NEDCC, 1999. (Accessed Sept. 19, 2003) URL: <http://www.nedcc.org/plam3/tleaf37.htm>

Department of the Interior. National Park Service. Preservation Assistance Division. *After the Flood: Emergency Stabilization and Conservation Measures*. Washington, D.C.: NPS, 1995.

Eulenberg, Julia Niebuhr. *Handbook for the Recovery of Water Damaged Business Records*. Prairie Village, KS: ARMA International, 1986.

Foster, Constance L. "Damaged Periodicals: A Wet Trail Yields Dry Results." *Serials Review*, 22, Iss. 1, (Spring 1996): 33-38.

Haskins, Scott M. *How to Save Your Stuff From a Disaster*. Santa Barbara, CA : Preservation Help Publications, 1996.

Kahn, Miriam B. *First Steps for Handling & Drying Water-Damaged Materials*. Columbus, OH: MBK Consulting, 1994.

Lewis, Steven. *Disaster Recovery Yellow Pages*. Newton, MA: Systems Audit Group, Inc., 1999.

Lundquist, Eric. *Salvage of Water-Damaged Books, Documents, Micrographic and Magnetic Media*. San Francisco: Document Reprocessors, 1986.

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

National Institute for the Conservation of Cultural Property. *Responding to Flooding*. Washington, D.C.: NIC, 1997.

Ogden, Sherelyn, ed. *Preservation of Library and Archival Materials: A Manual*, Third Edition, Revised and Expanded. Andover, MA : Northeast Document Conservation Center, 1999.

Ogden, Sherelyn. "Security From Loss: Water and Fire Damage, Biological Agents, Theft, and Vandalism." *Rare Books & Manuscripts Librarianship* 11, no. 1 (1996) : 43-47.

Patkus, Beth Lindblom. *Emergency Salvage of Moldy Books and Paper*. (Technical Leaflet: Emergency Management, Sect. 3, Leaflet 9.) Andover, MA : NEDCC, 1999, 2003. (Accessed Sept. 19, 2003) URL: <http://www.nedcc.org/plam3/tleaf39.htm>

Polloni, D. "Picking Up the Pieces" [Document SOS salvage and restoration experts]. *The Law Librarian* 26 (September 1995) : 409-11.

Riley, C.A. "In an Emergency: Salvaging Library Collections" [report of a program at the 2000 NASIG Conference]. *The Serials Librarian* 40, no. 1/2 (2001) : 19-30.

Spawn, Willman. "After the Water Comes." *Pennsylvania Library Association Bulletin* 28, No. 6 (1973) : 243-51.

Tremain, David. "Notes on Emergency Drying of Coated Papers Damaged by Water." Canadian Conservation Institute, n.d. (Accessed Sept. 19, 2003) URL: <http://palimpsest.stanford.edu/byauth/tremain/coated.html>.

United States Environmental Protection Agency. *Flood Cleanup: Avoiding Indoor Air Quality Problems*. (Fact Sheet 402-F-93-005.) Washington, D.C.: EPA, 1993.

Walsh, Betty. *Salvage Operations for Water Damaged Archival Collections: A Second Glance*. Ottawa: Canadian Council of Archives, 2003.

Waters, Peter. *Procedures for Salvage of Water-Damaged Library Materials*. 2<sup>nd</sup> ed. Washington, D.C.: Library of Congress, 1979.

Weidner, Marilyn Kemp. *Instructions on How to Unframe Wet Prints*. Cooperstown, NY : New York State Historical Association Library, 1973.

"What Do You Do With 426,500 Wet Books? or Options for Restoring a Water-Damaged Collection : at Colorado State University." *Library Journal* 124, no.. 20 (Dec. 1999 supp.) : 6-7.

---

## MICROFORMS

Dalton, Steve. *Microfilm and Microfiche*. (NEDCC Technical Leaflet: Reformatting, Sect. 5, Leaflet 1.) Andover, MA : NEDCC, 1999. (Accessed Sept. 9, 2003.) URL: <http://www.nedcc.org/plam3/tleaf51.htm>

Eastman Kodak Co. *Fire and Water Protection: Storage and Preservation of Microfilms*. Kodak Publication #D-31 (1981):2-5.

Klein, Henry. "Microfilm Resuscitation - A Case Study." *Journal of Micrographics* 9, no. 6 (July/August 1976) : 299-303.

Montuori, T.R. "Salvaging Damaged Microfilm." *Microfilm Techniques* 3, no. 10 (1973) :18.

Saffady, W. "Stability, Care and Handling of Microforms, Magnetic Media and Optical Disks." *Library Technology Reports* 27 (1991) : 33-87.

---

## PHOTOGRAPHIC MATERIALS

Albright, Gary E. *Emergency Salvage of Wet Photographs*. (Technical Leaflet: Emergency Management, Sect. 3, Leaflet 8.) Andover, MA : NEDCC, 1999. (Accessed Sept. 19, 2003) URL: <http://www.nedcc.org/plam3/tleaf38.htm> .

Albright, Gary E. "Flood Aftermath: The Preservation of Water-Damaged Photographs." In *Topics in Photographic Preservation*, Vol. 3, compiled by Robin E. Siegel. Washington: Photographic Materials Group of the American Institute for Conservation of Historic and Artistic Works, 1989.

Eastman Kodak Co. *Prevention and Removal of Fungus on Prints and Films*. Kodak Publication #AE-22 (1974. )

Eastman Kodak Co. *Treating Water Damage, Preservation of Photographs*. Kodak Publication #F-30 (1979) : 60-61.

Gillet, Martine, and Chantal Garnier. "The Use of Microwaves for Drying Flood Damaged Photographic Materials." In *Topics in Photographic Preservation*, Vol. 3, compiled by Robin E. Siegel. Washington: Photographic Materials Group of the American Institute for Conservation of Historic and Artistic Works, 1989.

Hawkos, Lise J. *Disaster Planning For Visual Resources Collections*. Ann Arbor, Mich.: Visual Resources Association, 1994.

Hendricks, Klaus, and Brian Lesser. "Disaster Preparedness and Recovery: Photographic Materials." *American Archivist* 46 (1983) : 52-68.

Norris, Debbie Hess. *Disaster Recovery : Salvaging Photograph Collections*. Philadelphia, PA : Conservation Center for Art and Historic Artifacts, 1998.

"A Look at Disaster Recovery." *Photographic Conservation* 1, no. 2 (1979) : 5.

"What to Do with Water Damaged Films." Kodak. *Technical Bits* No. 4 (1971) : 7-8.

---

## COMPUTER NETWORKS AND MEDIA (ELECTRONIC AND MAGNETIC)

Boss, Richard W. *Disaster Planning for Computers and Networks*. Chicago: American Library Association, Public Library Association, 2002. (Accessed Sept. 3, 2003) URL: [http://www.ala.org/Content/NavigationMenu/PLA/Publications\\_and\\_Reports/Tech\\_Notes/Disaster\\_Planning.htm](http://www.ala.org/Content/NavigationMenu/PLA/Publications_and_Reports/Tech_Notes/Disaster_Planning.htm)

Brownstein, Mark. "One Disk at a Time: Moldy Disks!" *CD-ROM EndUser* (February 1990) : 29.

"Computing: Planning for Disaster." *Architects' Journal* 176, no. 43 (October 27, 1982) : 73-79.

DeCandido, G.A. "Digital Disaster Planning: When Bad Things Happen To Good Systems." *Public Libraries* 39, no. 5 (Sept./Oct. 2000) : 258-9.

DeWhitt, Benjamin L. "Long-Term Preservation of Data on Computer Magnetic Media: Part I." *Conservation Administration News* 29 (April 1987) : 7, 19, 28.

DeWhitt, Benjamin L. "Long-Term Preservation of Data on Computer Magnetic Media: Part II." *Conservation Administration News* 30 (July 1987) : 4, 24.

Drewes, Jeanne. "Computers: Planning for Disaster." *Law Library Journal* 81 no. 103 (1989) : 103-116.

Hunt, Larry. "Storage Strategy for Disaster Recovery." Available on the website of AIIM International, c2003. (Last accessed Sept. 19, 2003) URL: [http://www.aiim.org/article\\_docrep.asp?ID=26233](http://www.aiim.org/article_docrep.asp?ID=26233)

Jones, Virginia A., and Kris E. Keyes. *Emergency Management for Records and Information Programs*. Prairie Village, Kansas: ARMA, 1997.

Kahn, Miriam. *Disaster Response and Prevention for Computers and Data*. Columbus, OH: MBK Consulting, 1994.

Miller, R. Bruce. "Libraries and Computers: Disaster Prevention and Recovery." *Information Technology and Libraries* 7 no. 4 (Dec. 1988) : 349-358.

Olson, Nancy B. "Hanging Your Software Up to Dry." *College and Research Libraries News* 47 (1986) : 634-36.

Saffady, W. "Stability, Care and Handling of Microforms, Magnetic Media and Optical Disks." *Library Technology Reports* 27 (1991) : 33-87.

Tennant, R. "Coping With Disasters [computer security]." *Library Journal* 1976, vol. 126, no. 19 (Nov. 15, 2001) : 26-8

Toito, John William. *Disaster Recovery Planning : Preparing for the Unthinkable*. 3<sup>rd</sup> ed. Upper Saddle River, NJ : Prentice Hall, 2003.

---

## MAGNETIC MEDIA (AUDIO AND VIDEO)

Eilers, Delos A. 1995. *Audio Magnetic Tape Preservation and Restoration*. Arlington, Va. : Association of Recorded Sound Collections, International Federation of Television Archives, International Association of Sound Archives, no. 17, Sept. 1995.

Gibson, Gerald D. "Emergency Preparedness and Disaster Recovery in Audiovisual Collections." *IASA Journal* 4 (November 1994) : 13-18.

St-Laurent, Gilles. *The Preservation of Recorded Sound Materials*. n.d. National Library of Canada, Music Division. (Accessed Sept. 2003). URL: <http://audio-restoration.com/gilles.php>

St-Laurent, Gilles. *The Care and Handling of Recorded Sound Materials*, 1996. (Accessed Sept. 9, 2003.) URL: <http://palimpsest.stanford.edu/byauth/st-laurent/care.html> .

Pennavaria, K. "Film, CD, and Audio/Video Tape Preservation: A Serious Problem For Libraries." *Kentucky Libraries* 66, no. 2 (Spring 2002) : 14-17.

Saffady, W. "Stability, Care and Handling of Microforms, Magnetic Media and Optical Disks." *Library Technology Reports* 27 (1991) : 33-87.

Schüller, Dietrich. "Strategies for the Safeguarding of Audio and Video Materials in the Long-Term." *IASA Journal* 4 (November 1994) : 58-65.

---

## **FREEZING AND FREEZE-DRYING**

Carlsen, Søren. "Effects of Freeze Drying on Paper." Preprint from the 9<sup>th</sup> International Congress of IADA, Copenhagen, August 15-21, 1999. (Accessed Sept. 19, 2003.) URL: <http://palimpsest.stanford.edu/byauth/carlsen/freeze-drying-effects/>

DeCandido, Robert. "Out of the Question." *Conservation Administration News* 32 (January 1988) : 21-22. (concerns freeze-drying techniques)

"Freeze-Drying." *Abbey Newsletter* 10, no. 5 (1986) : 71.

MacCleary, John. *Vacuum Freeze-Drying, a Method Used to Salvage Water-Damaged Archival and Library Materials : A RAMP Study with Guidelines*. Paris : UNESCO, 1987.

Stone, Janet L. "Evaluation of Post-Flood Handling and Vacuum Freeze-Drying Treatment of Archival Material : Frederick Law Olmstead National Historic Site." *Book and Paper Group Annual*, Vol. 5. Washington: The American Institute for Conservation of Historic and Artistic Works, 1986 : 167-73.

---

## **MOLD AND INSECTS**

Baas, Valerie. "Know Your Enemies." *History News* 35, No.7 (July 1980) : 40-41. (concerns insects)

Baker, W. "Preservation Perspectives: Mold in the Stacks: a Universal Problem." *Kentucky Libraries* 65, no. 3 (Summer 2001) : 20-2.

Brown, D.R. "Collection Disaster: Mold in the Stacks." *College & Research Libraries News* 64, no. 5 (May 2003) : 304-6.

Butcher-Youngmans, Sherry and Gretchen E. Anderson. *A Holistic Approach to Museum Pest Management*. (American Association for State and Local History [AASLH] Technical Leaflet 191) Nashville, TN : AASLH, 1990.

Chamberlain, William R. "Fungus in the Library." *Library and Archival Security* 4, no. 4 (1982) : 35-55.

Eastman Kodak Co. *Prevention and Removal of Fungus on Prints and Films*. (Customer Service Pamphlet, no. AC-2.) Rochester, NY : Kodak, 1980.

Harmon, James D. *Integrated Pest Management in Museum, Library and Archival Facilities*. Indianapolis : Harmon Preservation Pest Management, 1993.

Kaplan, Hilary A. *Mold : A Follow-Up*. 1998. (Accessed Sept. 9, 2003.) URL: <http://palimpsest.stanford.edu/byauth/kaplan/moldfu.html> .

"Learning From Experience: A Trial-and-Error Approach to Disaster Planning: Mold Outbreaks at the University of the South." *The Southeastern Librarian* 44 (Summer 1994) : 62-6.

"Mould: The Invasive Intruder!" *Australian Library Journal* 50, no.2 (May 2001):175-80.

Nitterus, M. "Fungi in Archives and Libraries: a Literary Survey." *Restaurator* 21, no. 1 (2000) : 25-40.

Nyberg, Sandra. *The Invasion of the Giant Spore*. (SOLINET Preservation Program, Leaflet No. 5.) Atlanta : Southeastern Library Network, 1987.

Parker, Thomas A. *Study on Integrated Pest Management for Libraries and Archives*. Paris : UNESCO, General Information Program and UNISIST, 1988.

Patkus, Beth Lindblom. *Integrated Pest Management*. (Technical Leaflet: Emergency Management, Sect. 3, Leaflet 11.) Andover, MA : NEDCC, 1999, 2003. (Accessed Sept. 19, 2003) URL: <http://www.nedcc.org/plam3/leaf311.htm>.

Pelz, P. and M. Rossol. *Safe Pest Control Procedures for Museum Collections*. New York : Center for Occupational Hazards, 1983.

Pinniger, D. B. *Insect Pests in Museums*. London : Archetype, 1994.

Smith, E.H. "Mold abatement in a remote storage facility." *Library & Archival Security* 15, no. 1 (1999) : 75-82.

Wellheiser, Johanna G. *Nonchemical Treatment Processes for Disinfection of Insects and Fungi in Library Collections*. New York : K.G. Saur, 1992.

---

## DISASTER PLANNING METASITES

American Library Association. *Disaster Response: A Selected Annotated Bibliography*. (ALA Library Factsheet 10.) (Last accessed Sept. 19, 2003) URL: [www.ala.org/library/fact10.html](http://www.ala.org/library/fact10.html)

The *Disaster Recovery Journal's* Internet web site. (Last accessed Sept. 19, 2003) URL: <http://www.drj.com/>

FEMA. *Virtual Library and Electronic Reading Room*. (Last accessed Sept. 19, 2003) URL: <http://www.fema.gov/library/>

Medical Library Association. *Community of Caring*. (Last accessed Sept. 19, 2003) URL: [www.mlanet.org/resources/caring/index.html](http://www.mlanet.org/resources/caring/index.html)

NorthEast Document Conservation Center. *Preservation of Library & Archival Materials : Emergency Management*. (Last accessed Sept. 19, 2003) URL:  
[www.nedcc.org/plam3/index3.htm](http://www.nedcc.org/plam3/index3.htm)

Solinet. *Preservation: Disaster Mitigation and Recovery Resources*. (Last accessed Sept. 19, 2003) URL:  
[http://www.solinet.net/preservation/preservation\\_templ.cfm?doc\\_id=71](http://www.solinet.net/preservation/preservation_templ.cfm?doc_id=71)

Special Libraries Association. *Disaster Planning Portal*. (Last accessed Sept. 19, 2003) URL:  
<http://www.sla.org/content/SLA/sept11help/disip/index.cfm>

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## 6. SOURCES

### Index to Specialized Services (by topic) Specialized Services Directory

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#### INDEX TO SPECIALIZED SERVICES (by topic)

##### **AIR DRYING OF MATERIALS**

- Midwest Freeze-Dry, Ltd
- Munters Corporation
- SOLEX Environmental Systems

##### **CLEANING OF INTERIORS**

- BMS-CAT
- SERVPRO

##### **CLEANING OF MATERIALS**

- American Freeze-Dry, Inc.
- Document Reprocessors
- Midwest Freeze-Dry, Ltd
- National Library Relocations
- SERVPRO

##### **CONSERVATION TREATMENT OF MATERIALS**

- Conservation Center For Art and Historic Artifacts
- NorthEast Document Conservation Center

##### **DAMAGE APPRAISAL**

- Action Front Data Recovery Labs (electronic data)
- BMS-CAT
- Pro Libra (task-cost analysis)

##### **DEBRIS REMOVAL**

- BMS-CAT

##### **DEHUMIDIFICATION/RH CONTROL**

- BMS-CAT
- Munters Corporation
- SERVPRO
- SOLEX Environmental Systems

##### **DISASTER PLANNING AND RECOVERY CONSULTATION**

- Action Front Data Recovery Labs (electronic)
- Associated Technologies & Data Recovery (electronic)
- Conservation Center For Art and Historic Artifacts
- Library Of Congress, Preservation Directorate
- Midwest Freeze-Dry, Ltd
- NorthEast Document Conservation Center

##### **DOCUMENT RECOVERY / RESTORATION**

- Conservation Center For Art and Historic Artifacts
- Document Reprocessors (drying)
- Munters Corporation
- NorthEast Document Conservation Center
- SERVPRO
- SOLEX Environmental Systems

##### **DOCUMENT REPRODUCTION**

- BMS-CAT
- NorthEast Document Conservation Center

**ELECTRONIC DATA PROTECTION**

—Associated Technologies & Data Recovery  
—Munters Corporation (data storage devices)

**ELECTRONIC DATA RECOVERY / CONVERSION**

—Action Front Data Recovery Labs  
—Associated Technologies & Data Recovery  
—BMS-CAT (hard drive recovery)

**ELECTRONIC HARDWARE RECOVERY / PROTECTION**

—BMS-CAT  
—Document Reprocessors (drying)  
—Munters Corporation  
—SOLEX Environmental Systems

**ELECTRONIC MEDIA RECOVERY and RESTORATION (CD, CD-ROM, DVD)**

—Action Front Data Recovery Labs  
—Associated Technologies & Data Recovery  
—Document Reprocessors (drying)  
—Midwest Freeze-Dry, Ltd (drying, cleaning, copying)  
—SOLEX Environmental Systems

**EQUIPMENT RENTAL**

—National Library Relocations

**FIRE AND WATER DAMAGE (GENERAL)**

—Document Reprocessors

**FIRE AND WATER DAMAGE OF ELECTRONIC AND MAGNETIC MEDIA**

—Action Front Data Recovery Labs

**FIRE PROTECTION INFORMATION**

—National Fire Protection Association

**FREEZE DRYING**

—American Freeze-Dry, Inc.  
—BMS-CAT  
—Document Reprocessors

—Midwest Freeze-Dry, Ltd  
—Munters Corporation  
—SOLEX Environmental Systems

**FREEZER STORAGE**

—American Freeze-Dry, Inc.  
—Conservation Center For Art and Historic Artifacts  
—Document Reprocessors

**FUMIGATION**

—American Freeze-Dry, Inc.  
—BMS-CAT  
—Document Reprocessors  
—Midwest Freeze-Dry, Ltd  
—SOLEX Environmental Systems

**INVENTORY OF MATERIALS**

—BMS-CAT  
—Document Reprocessors  
—Pro Libra

**MAGNETIC MEDIA RECOVERY (audio, video, electronic)**

—Action Front Data Recovery Labs  
—BMS-CAT (floppy discs)  
—Document Reprocessors (drying)

**MICROFORMS DRYING**

—Document Reprocessors  
—Midwest Freeze-Dry, Ltd

**MICROFORMS RESTORATION**

—BMS-CAT  
—Midwest Freeze-Dry, Ltd (drying and cleaning)  
—NorthEast Document Conservation Center

**MOISTURE REMOVAL FROM INTERIORS AND FURNISHINGS**

—Munters Corporation  
—SOLEX Environmental Systems

**MOLD REMEDIATION / REMOVAL**

—Midwest Freeze-Dry, Ltd  
—SERVPRO

**ODOR REMOVAL**

- Midwest Freeze-Dry, Ltd (non-chemical)
- SERVPRO

**PACKING OF MATERIALS**

- BMS-CAT
- Midwest Freeze-Dry, Ltd

**PEST CONTROL**

- Midwest Freeze-Dry, Ltd

**PHOTO RECOVERY**

- Conservation Center For Art and Historic Artifacts
- Document Reprocessors (drying)
- Midwest Freeze-Dry, Ltd (drying and cleaning)
- NorthEast Document Conservation Center

**REBINDING AND RESTORATION**

- Document Reprocessors
- Midwest Freeze-Dry, Ltd

**RECORD CONTROL**

- Pro Libra

**REMOVAL OF AIRBORNE CONTAMINANTS**

- SOLEX Environmental Systems

**RESHELVING**

- Document Reprocessors
- Midwest Freeze-Dry, Ltd

**SMOKE / SMOKE ODOR REMOVAL**

- American Freeze-Dry, Inc.
- BMS-CAT
- Document Reprocessors
- Midwest Freeze-Dry, Ltd
- SERVPRO

**SOOT REMOVAL**

- BMS-CAT
- Midwest Freeze-Dry, Ltd
- SERVPRO

**SORTING**

- National Library Relocations

**TEMPORARY PERSONNEL**

- National Library Relocations
- Pro Libra

**TRANSPORTATION OF MATERIALS**

- BMS-CAT
- Midwest Freeze-Dry, Ltd
- National Library Relocations
- Pro Libra (relocation assistance)
- SERVPRO (move out and storage)

**WATER REMOVAL**

- Munters Corporation
- SERVPRO

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## SPECIALIZED SERVICES DIRECTORY

### **ACTION FRONT DATA RECOVERY LABS**

85 Scarsdale Road, Suite 100

Toronto, ON M3B 2R2

Canada

800-563-1167 FAX: 800-563-6979

416-510-6990 FAX: 416-510-6992

<http://www.actionfront.com/index.asp>

#### **Services:**

- hard disk-drive recovery
- fire and water damage
- virus
- media restoration services
- tape and removable media recovery
- in-lab services
- onsite services

Action Front has four full service data recovery facilities in the United States and Canada, including a receiving center in Buffalo. They are the only data recovery company to be registered to the ISO 9001:2000 - International Quality Standard. They also pioneered the concept of free evaluations with "No data - No charge" policies and offer a free evaluation service for data recovery.

The company's goal is to recover data - as quickly, completely and economically as possible. This recovery applies to data stored on servers, hard disk drives, laptops and notebooks, removable media, even databases. The Critical Response Service is available 24 hours a day, 7 days a week.

### **AMERICAN FREEZE-DRY, INC.**

P.O. Box 264

Runnemede, N.J. 08078

800-817-1007 FAX: 856-546-0777

EMERGENCY: 609-458-0510

<http://www.americanfreetzedry.com>

#### **Services:**

- vacuum freeze drying of books and files
- freeze-drying
- freezer storage – minus 20 degrees
- plastic milk crates – loan
- refrigerated trucks – by arrangement
- fumigation – by arrangement
- smoke odor removal – by arrangement
- cleaning of materials – by arrangement

American Freeze-Dry's business, as the name implies, is freeze-drying. The company has been in existence since 1976 and deals mainly with library books and office files, although it has dried artifacts of leather and wood on occasion. American Freeze-Dry's vacuum freeze drying chamber is smaller than those of some other companies – it can hold roughly 50 cubic feet of books or files, depending on the type of material involved – but it is adequate for the most common water disasters, which a company representative estimated as usually affecting between 20 and 80 cubic feet. Costs for drying vary according to the type of paper, the volume of material, and the degree of saturation. Drying takes from 3 days to two weeks for totally wet books.

Other services that the company offers include: -20° storage space for materials waiting to be freeze-dried, storage for dried materials waiting to be returned (this is free for 30 days), pick-up and delivery, fumigation, cleaning and smoke odor removal. They also have a supply of plastic milk crates for use by customers who have difficulty obtaining them elsewhere. Libraries and other institutions may arrange for an annual service contract, which functions as a sort of freeze-drying insurance policy, and which varies in cost according to the size of the collection. For one fee, American Freeze-Dry will handle all the freeze-drying needed by the institution for that year, including pick-up and delivery. American Freeze-Dry's services are available on weekends, holidays, and after work hours; they may be reached by phone at any time. References are available on request from the company.

#### **ASSOCIATED TECHNOLOGIES & DATA RECOVERY**

7621 Knox Ave. South, Suite 313  
Minneapolis, MN 55423  
612-243-1344 FAX: 612-861-5059  
<http://www.datarecovery.com>

#### **Services:**

- on-site services
- data protection and computer crime consulting
- data destruction and drive sanitation
- media and data conversion
- disaster recovery planning
- ability to handle sensitive government data

Associated Technologies offers complete data recovery solutions with services for any type of data storage device including hard disk drives, networks, floppy diskettes, optical drives, DAT, 4 and 8 mm tape, ¼ inch cartridge, DLT (Digital Linear Tape), 3480, 3490 and 3490E, and 9-track reel-to-reel. A.T. offers a full repertoire of software products dedicated to data management, protection and recovery.

### **BMS CATASTROPHE (BMS-CAT)**

303 Arthur Street  
Fort Worth, TX 76107  
24-Hour: 800-433-2940 FAX: 817-332-6728  
CELL: 228-806-9550  
<http://www.bmscat.com>

#### **Services:**

- freeze-drying
- vacuum freeze-drying
- portable blast freezer available
- damage appraisal
- inventory, packing, and transportation of materials
- document reproduction
- restoration/reproduction of microforms and floppy disks
- soot and smoke odor removal
- fumigation and dehumidification
- hard drive recovery
- corrosion control of electronic equipment
- debris removal
- cleaning of interiors – ceilings, walls, floors and furnishings

BMS-CAT specializes in all disaster recovery services, including those for damage from fire, water, corrosion, and hazardous material contamination. BMS-CAT operates 17 regional response centers in the U.S., each fully equipped to handle multiple projects simultaneously. BMS-CAT can call on these centers to provide the base for any large-scale restoration project.

BMS-CAT provides comprehensive restoration services, including vacuum freeze-drying of records materials, corrosion control for electronic and office equipment, debris removal, cleaning and restoring of furnishings, soot and smoke odor removal, and restoration of heating and air conditioning systems. Emphasis is placed on speed to help minimize damage, and to enable the affected organization to resume operations as quickly as possible. The company will inventory and box damaged library materials, and can either transport them to their plant for treatment or move their equipment to the disaster site.

Cleaning and restoration of fire-damaged office files can be handled either on-site or at one of the company's plants. Soot is removed with dry chemical sponges, and burnt edges can be trimmed off. BMS-CAT offers document reproduction services as well, including photocopying, microfilming, and transferring data to microfiche. They are trained to retrieve computer data and to preserve information stored on tapes and disks.

### **CONSERVATION CENTER FOR ART AND HISTORIC ARTIFACTS**

264 South 23<sup>rd</sup> Street  
Philadelphia, PA 19103  
215-545-0613 FAX: 215-735-9313  
<http://www.ccaha.org>

Services:

- regional services
- disaster planning advice
- disaster recovery assistance and advice
- conservation of documents and photographic materials
- freezer space for up to 50 cubic feet of damaged materials

CCAHA specializes in the treatment of art and historic artifacts on paper, including drawings, prints, maps, posters, photographs, rare books, and musical scores. CCAHA personnel will answer questions over the phone, and can provide on-site assistance during an emergency. They can also help in disaster preparedness and recovery, and in restoration of water and fire damaged materials.

## DOCUMENT REPROCESSORS

*East Coast*

5611 Water Street  
Middlesex, NY 14507  
HOTLINE: 585-554-4500      FAX: 585-554-4114  
24-HOUR: 800-437-9464

*West Coast*

1384 Rollins Rd.  
Burlingame, CA 94010  
HOTLINE: 650-401-7771      FAX: 650-401-8711

[www.documentreprocessors.com](http://www.documentreprocessors.com)

**Services:**

- vacuum freeze-drying of books and files
- freeze-drying
- freezer storage
- drying of microforms, floppy disks, audio/video tapes, disk drives, photos/negatives
- inventory of materials – by arrangement
- smoke odor removal – by arrangement
- cleaning of materials – by arrangement
- fumigation – by arrangement
- rebinding and restoration – by arrangement
- reshelving
- air drying of materials

Document Reprocessors is a freeze-drying service, which is based in Burlingame, CA, but has done work for organizations all over the U.S. and in Canada. The company has been in business since 1979; it instituted the use of large mobile drying chambers in 1982. Document Reprocessors now has a facility near Rochester, which can provide all of the services that the company offers, including the use of two large mobile drying chambers. They have been involved in a large number of library and business drying projects of different scales, and claim a 98% success rate at returning wet materials to readable condition.

Document Reprocessors is equipped to freeze-dry books and documents either at its plant, or in seven mobile drying chambers that can be transported to the disaster site. Three of these chambers are mounted on trailer chassis and are self-contained, having their own power sources built in (they may also be connected to local electric power). They have a capacity of 640 cubic feet, which corresponds roughly to 10,000 books or 13 million documents. The drying cycle takes from eight to ten days, depending on the moisture content of the materials being dried. Moisture content of the books is tested with a gauge following the freeze-drying. Two 8,000-book chambers are also available, as are two 500-book chambers that can be transported via 747 airliner.

Aside from freeze-drying wet materials, the company offers other on-site services for disaster recovery, some of which are done in conjunction with other specialist firms and suppliers of temporary personnel. These services include: inventorying damaged materials via computer lists and bar-coding; refrigeration; air-drying of damp materials, including microforms and floppy disks; smoke removal and cleaning; fumigation and sterilization; rebinding, restoration or replacement; and reshelving of dried books. References are available from the company on request.

#### **LIBRARY OF CONGRESS, PRESERVATION DIRECTORATE**

101 Independence Ave  
Washington, DC 20540-4500  
202-707-5213 FAX: 202-707-3434  
<http://www.loc.gov/preserv>

##### **Services:**

- consultants
- disaster planning advice
- disaster recovery advice

The Library of Congress preservation staff will provide advice and assistance for both disaster planning and for the recovery of water-damaged library materials. They do not usually make on-site visits. They provide advice via their website mentioned above.

#### **MIDWEST FREEZE-DRY, LTD.**

7326 N. Central Park  
Skokie, IL 60076  
24-Hour: 847-679-4756 FAX: 847-679-4191  
<http://www.midwestfreezedryltd.com>

##### **Services:**

- freeze-drying
- non-chemical vacuum freeze-drying
- plasma gas fumigation
- desiccant air drying
- organizing, packing and transportation of materials

- mold remediation (ultraviolet)
- non-chemical odor removal
- non-chemical pest control
- refrigeration trucks
- removal of surface dirt, mold and soot
- rebinding
- clean, dry, copy disks
- technical consulting
- clean, dry photos, microforms
- re-shelving and re-filing

Midwest Freeze-Dry specializes in non-chemical methods. Over 18 years of experience have enabled them to develop advanced concepts they've applied to the conservation and restoration of schools and commercial buildings, of water, fire, mold and smoke damaged books, textiles, wooden objects, documents, artwork, memorabilia, photographs and more.

### **MUNTERS MOISTURE CONTROL SERVICES**

General Inquiries  
 79 Monroe St. (P.O. Box 640)  
 Amesbury, MA 01913  
 800-MUNTERS  
 978-241-1115 FAX: 978-241-1263  
<http://www.muntersamerica.com/mcs/htm/mcdivhm.htm>

### **MUNTERS CORPORATION: MOSITURE CONTROL SERVICES**

6900 Peachtree Industrial Blvd., Suite 1  
 Norcross, GA 30071  
 800-890-9877  
 770-242-0935

#### **Services:**

- moisture removal
- water pumping
- water vacuuming
- moisture removal – floors, walls, furnishings, etc.
- structural drying
- dehumidification – RH control
- air drying of materials “low vapor pressure air drying”
- freeze-drying service available on sub-contract basis
- document restoration
- electronic equipment and data storage protection

Moisture Control Services (MCS), a division of Munters Corp., provides water and fire damage restoration, leak detection and temporary solutions for dehumidification, heating and cooling. Although MCS's main customers are in industry, libraries are a large part of the market for its services. MCS is structured to handle any size job.

MCS has compiled a list of conservation professionals in various parts of the country who can be called upon to assist when the company is consulted on a library loss. Emergency service is available 24 hours a day. MCS can

provide: water pumping and vacuuming, measurement of water content in the air, surfaces, and objects; and drying of floors, walls, floor and wall coverings, insulation, and furnishings. They recover books, documents, files, medical records, electronic media, audio-visual materials, x-rays, computer systems, or legal records that are water damaged. The drying process is monitored with instruments by MCS employees. Equipment is usually not sold to the institution, but rented until the problem is resolved.

The company can also deal with waterlogged books if they do not contain coated paper. The wet books are removed to the MCS facility and placed in a chamber for "low vapor pressure air-drying." The books are placed on wire racks, and the humidity in the chamber is lowered to 12-15% RH and kept in that range by constant air movement until the books are slightly below their normal moisture content (7-8%). Each book is individually monitored for temperature and moisture content during the process, with measurements being taken in several spots throughout the volume. When necessary, MCS will establish an on-site drying facility to meet an institution's special needs; books and room can be dried at the same time. In such a case, the library can use its own staff for some of the monitoring, and thus lower the cost of this labor-intensive method. References are available from the company on request.

Munters can provide specialized expertise to restore computer data processing centers, and data storage systems. Vulnerable electronics can be preserved after fires from acidic corrosion. Cable runs can be dried quickly with cables in place. Storage media can be preserved. Moisture-laden, high humidity environments can be stabilized fast enough to save equipment.

Mold and mildew will quickly grow on water-soaked documents or in high humidity areas. MCS desiccant drying techniques eliminate the moisture that fungi require for growth. By quickly dehumidifying water-damaged areas, the microbiological contamination, and associated objectionable odors can be prevented.

#### **NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)**

1 Batterymarch Park  
Quincy, MA 02269-9101

617-770-3000

FAX: 617-770-0700

<http://www.nfpa.org/>

The NFPA provides information on fire protection, prevention, and suppression, and conducts fire safety education programs for the general public. They also publish standards, some of them pertaining directly to libraries, archives, and museums, which are intended to minimize the possibility and effects of fire and explosion. A catalog of NFPA publications and products is available at <http://www.nfpa.org/Catalog/>

#### **NATIONAL LIBRARY RELOCATIONS**

70 Bridge Road  
Central Islip, NY 11722  
800-486-6837

<http://www.nlrbookmovers.com/>

**Services:**

- temporary personnel
- moving of collections
- equipment rental – book trucks, vacuums, dollies, bins, ramps, cartons
- cleaning of materials – tank and backpack vacuums
- integrating/segregating collections
- bar-coding for automation
- security stripping

National Library Relocations specializes in moving library collections, and although they are not a disaster recovery service, *per se*, they could be of help with the shifting that is necessary after a large-scale disaster. NLR has been in business for several years, and can offer packing, equipment rental, cleaning and shelving services.

**NORTHEAST DOCUMENT CONSERVATION CENTER**

100 Brickstone Square  
Andover, MA 01810-1494  
24-HOUR: 978-470-1010      FAX: 978-475-6021  
<http://www.nedcc.org>

**Services:**

- regional center
- disaster planning advice
- disaster recovery advice and assistance
- conservation treatment of books, documents, photographs, art on paper and other paper-based objects; duplication of photographs and preservation microfilming

NEDCC will provide emergency assistance over the phone at no charge, and may be reached day or night, seven days a week. In the case of a major disaster, a representative may be sent to provide help on-site. The Center's staff has experience in dealing with water-damaged, paper-based materials.

**PRO LIBRA**

6 Inwood Place  
Maplewood, NJ 07040  
800-262-0070  
973-762-0070      FAX: 973-763-6500  
<http://www.prolibra.com/>

**Services:**

- temporary & permanent personnel
- task cost analysis
- inventory and record preparation
- re-labeling
- bar-coding & security stripping
- rearrangement
- relocation assistance

- merging collections and more

Pro Libra is a multi-service company that provides a wide range of support activities to information centers throughout the country. The company can supply trained personnel for temporary assignments, and will perform “one-time, extraordinary, labor-intensive tasks.” Although Pro Libra is set up as a contractor for more general library support activities, it does list disaster recovery among its services. This includes providing personnel for record control, sorting damaged items, and packing boxes.

**SERVPRO:**

Cleaning and Restoration Company

24-HOUR: 800-SERVPRO (access 950+ offices)

<http://www.servpro.com>

Local: *Amherst-Clarence*

57 Windsong Court Suite 101

Amherst, NY 14051-1664

716-639-8687 FAX: 716-694-9952

[www.servpro.com/franchises/5799.htm](http://www.servpro.com/franchises/5799.htm)

*Buffalo/Tonawanda*

Same address as above

716-873-3007 FAX: 716-694-9952

[www.servpro.com/franchises/1509.htm](http://www.servpro.com/franchises/1509.htm)

*East Erie County*

Same address as above

716-656-7131 FAX: 716-694-9952

[www.servpro.com/franchises/5825.htm](http://www.servpro.com/franchises/5825.htm)

*Eastern Niagara County*

P.O. Box 42

North Tonawanda, NY 14120

716-694-7776 FAX: 716-885-6193

[www.servpro.com/franchises/8794.htm](http://www.servpro.com/franchises/8794.htm)

*Southtowns*

107 Evans Street

Hamburg, NY 14075

716-646-6684 FAX: 716-646-6918

[www.servpro.com/franchises/8217.htm](http://www.servpro.com/franchises/8217.htm)

**Services:**

- water removal
- dehumidification
- document restoration
- catastrophic loss services
- smoke and soot removal
- deodorization
- structure and contents cleaning
- move-out and storage services

SERVPRO is a multi-service company serving all 50 states and specializing in fire and water damage mitigation and restoration services. They provide immediate response, 24 hours a day, 7 days a week.

### **SOLEX ENVIRONMENTAL SYSTEMS**

P.O. Box 550045

Houston, TX 77055

24-HOUR: 713-963-8600

FAX: 713-461-5877

<http://www.solexrobotics.com/>

#### **Services:**

- moisture removal and freeze-drying
- vacuum freeze-drying
- freezer storage
- moisture removal – floors, walls, furnishings, computers
- dehumidification – RH control
- removal of airborne contaminants – soot, asbestos, PVCs
- air-drying of materials
- fumigation – by arrangement
- electronics restoration
- temporary air conditioning
- rare book and document restoration

Solex is a fire and water damage recovery service that maintains a comprehensive system for emergency environmental control to arrest and reverse the destructive elements unleashed by a disaster. Although based in Houston, Solex has a “high degree of mobility”. The company has responded to emergencies in Los Angeles (the LA Public Library fire being one instance), Detroit, Florida, and Singapore, and considers itself international in scope.

Solex specializes in drying out buildings and their contents, including collections, walls, floors, ceilings and furnishings. It has also dealt with water-damaged computers. Solex can air dry enclosed spaces with their contents still in place. This process is not suitable for materials on coated paper, however. It can convert a building or a room into a freezer if necessary, or can provide refrigerated trucks for cold storage on-site. The company also has a vacuum chamber with a capacity of approximately 600 boxes of books; drying times vary from several hours to four or five days. Other services include emergency environmental control, provision of temporary heating or air conditioning, removal of soot from air conditioning systems, removal of airborne contaminants such as asbestos and PVCs, and arranging for fumigation. Solex has significant experience in addressing disasters that affect museums, cultural institutions, archives and libraries.

## SOURCES FOR SUPPLIES 2003

This appendix has traditionally been a list of local vendors from which the supplies recommended in reference chapter 3, "Protection" may be purchased. Past experience has shown, however, that such a list is not very useful in the long term. First, a comprehensive list of vendors available in a region as large as Western New York is difficult to compile—such a list could never be truly comprehensive. Second, lists such as these are dated. For instance, in reviewing the appendix in the last version of this manual it was discovered that many vendors listed had moved or were no longer in business. Finally, since the choice of suppliers should be a local one, it seemed logical to forego a dictated list of suppliers and instead, provide a **guide** that would assist individual institutions in developing their own customized lists—ones that would utilize local vendors and suppliers and be specific to the needs of the individual library. What's more, a generic guide such as this may easily be adapted for use by those institutions outside of the Western New York region, who may be referencing this manual.

This guide serves as a reference to the types of vendors that provide basic disaster preparedness supplies. Supplies are listed alphabetically below, with "yellow page" headings for each item, and the type of store(s) in which to find the item.

Institutions in all communities are urged to use the yellow pages of their telephone directories to make contacts and confirmations with local vendors to be certain of current availability. This "Sources for Supplies" should be used as a reference when completing W-11 and W-12 in the Worksheet section.

<b>ITEM</b>	<b>LOOK IN YELLOW PAGES UNDER ...</b>	<b>TYPE OF SUPPLIER</b>
Air packets	<b>Packaging materials</b>	Bag/container companies
Blotting papers	<b>Office supplies</b>	Office supplies; discount department stores
Boxes	<b>Boxes</b>	Container, packaging companies, supermarkets; office supplies
Cleaning Services	<b>Cleaning services – Industrial</b>	N/A
Dust filter masks	<b>Safety Equipment &amp; Clothing</b>	Hardware stores; building supplies
Emergency lights	<b>Lighting equipment – Emergency</b>	Lighting companies; building supplies; hardware stores
Fencing (Safety)	<b>N/A</b>	Building supplies
Fire extinguishers	<b>Fire extinguishers</b>	Fire & safety companies; fire extinguisher companies
First aid kits	<b>First aid supplies</b>	Drugstores
Fork lifts	<b>Fork lifts</b>	Lift truck companies; machinery rental companies
Freezer paper	<b>N/A</b>	Supermarkets
Freezer space & trucks	<b>Ice cream &amp; frozen desserts – Dealers</b>	Supermarkets; ice cream companies; pizzerias
Generators	<b>Generators – Electric</b>	Equipment rental companies; generator companies
Gloves (Heavy)	<b>Gloves – Work &amp; Industrial</b>	Building supplies; glove companies; hardware stores
Gloves (Surgical)	<b>Gloves – Surgical &amp; Examination</b>	Hardware stores; medical supplies companies
Grocery carts	<b>N/A</b>	Supermarkets

<b>ITEM</b>	<b>LOOK IN YELLOW PAGES UNDER ...</b>	<b>TYPE OF SUPPLIER</b>
Hand trucks	<b>Fork lifts; Material handling equipment</b>	Lift truck, machinery rental companies; building supplies
Hard hats	<b>Safety equipment &amp; clothing</b>	Building supplies; hardware stores
Hygrometers	<b>N/A</b>	Cole-Parmer catalog
Janitorial services	<b>Janitor service</b>	Cleaning companies
Milk crates (metal)	<b>Dairies</b>	Dairies
Milk crates (plastic)	<b>Office supplies</b>	Office supplies; discount department stores
Mylar sheets	<b>Office supplies</b>	Office supplies
Pallet trucks	<b>Fork lifts; material handling equipment</b>	Fork lift companies; machinery rental
Pallets	<b>Pallets &amp; skids</b>	Pallet suppliers and services; lumber companies
Paper towels	<b>N/A</b>	Supermarkets; janitorial supplies companies
Plastic bags	<b>Bags-transparent &amp; plastic</b>	Supermarkets; janitorial supplies companies
Plastic sheeting	<b>N/A</b>	Building supplies; hardware stores; lumber companies
Portable toilets	<b>Toilets – Portable</b>	Portable toilet & septic/sanitation companies
Pumps	<b>Pumps – Dealers</b>	Pump dealers; machinery rental companies; building supplies
Radios, Two-way	<b>Radio communication equipment &amp; systems</b>	Electronics/communication companies
Trucks	<b>Truck renting &amp; leasing</b>	Truck rental, machinery rental companies

<b>ITEM</b>	<b>LOOK IN YELLOW PAGES UNDER ...</b>	<b>TYPE OF SUPPLIER</b>
Vacuums (wet/dry)	<b>Vacuum cleaners – Industrial &amp; commercial</b>	Vacuum cleaner dealers; janitorial supplies companies
Waxed paper	<b>N/A</b>	Supermarkets