Preservation Concerns in Planning a Records Center

Developed by the
Local Records Preservation Program,
Missouri State Archives
Office of the Secretary of State

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Preservation Goals

- ensure longevity (slow-down deterioration) of the records through environmental control
- provide security against theft and damage
- protect against fire, water damage, and other disasters

Location, Location, Location

Hazards to Avoid

- flood plain *(danger of flooding)*
- nearby railroad tracks *(danger of chemical spills or hazardous-materials disasters)*

Exterior Lights

- Large lights should be placed *away* from the building and shining *onto* it. In the picture below, lights are positioned on the entry canopy, shining toward the flagpole. This arrangement attracts bugs *toward* the light (and, thus, *toward* the windows and front door) at night.

The Building Envelope

Roof & Gutters

- in good condition
- determine age and projected life of roof
- gutters: be sure they are intact, and clean them regularly

Downspouts

- unobstructed, draining freely
- should drain water *away* from the foundation (This one doesn't!)

Floors

- load-bearing capacity: minimum of 300 pounds per square foot

Carpeting

- Just say “NO!”
- Carpet and rugs harbor insects, are a breeding ground for mold, and complicate disaster-recovery efforts when you have a water leak
- Do not carpet storage areas
- Avoid carpet in public/reference areas

Plumbing

- no water-bearing pipes above record storage areas
- no leaks

Windows

- glass intact -- no cracks or broken windows
- frames/sills in good condition
- caulking intact

Screened Openings

- screens (in doors, windows, and crawl-space vents) should be under 1/4” -- otherwise, it’s large enough to allow mice to enter

Landscaping

- no organic material within 12” of building -- e.g., use rock instead of mulch -- as organic material provides food and shelter for insects that will then move into your building
- shrubs should not obscure windows and doors, so that burglars/thieves cannot use them as a shield

Environmental Control

Temperature

- *all* heat accelerates the chemical reactions that cause paper to deteriorate
- the lower the temperature, the longer paper will last

Relative Humidity (RH)

- moisture accelerates the chemical reactions that cause paper to deteriorate
- wide, frequent humidity fluctuations are devastating to paper
- mold grows at high RH (generally above 50% -- and *high risk* above 70%)
- keep the RH as low as possible, but above 30%

Temperature/RH for Paper

Situation	Temp.	RH
combined stack/user areas	70° F max.	30-50%
stacks that people seldom enter	65° F max.	30-50%
optimum stacks	35-65° F	30-50%
maximum daily fluctuation	±2° F	± 3%
maximum monthly drift	3° F	3%

Temp./RH for Microfilm Masters

Storage Goal	Temp.	RH
medium-term (ca. 10 yrs.) -- e.g., print masters	77° F max.	20-50%
extended-term (forever) -- e.g., archival master	70°F max.	20-30%
	59°F max.	20-40%
	50°F max.	20-50%
maximum daily fluctuation	±2° F	± 5%

Temperature/RH for Other Media

Medium	Temp.	RH
photographs	68° F	35-40%
non-permanent paper records	75° F max.	below 70%

Not All Records Are Created Equal!

- Different records have different temperature & humidity requirements .
- Permanent records (whether paper, photos, microfilm, etc.):
  - They have ***very*** strict temperature & humidity requirements to ensure long-term preservation.
  - ***No*** commercial "self-storage" or "u-store-it" type of facility is good enough to meet archival requirements!
  - Even permanent records don't require ***optimum*** temperature/RH if you have archival microfilm stored offsite in appropriate conditions!
- Short-term records can survive in *much* less stringent conditions.

Climate Control in a Mixed-Record Center

- Permanent records will age prematurely if good climate and storage are not provided
- You may waste money providing *optimum* environment for *all* your records
- You can build a *low-tech warehouse-type* structure for most of your records, with a small, *highly-engineered special vault* for your permanent records. (Illustrated in the next two slides.)

Storing Mixed Collections

- Provide "warehouse" environment for short-term records …

… with strict “preservation environment” only for permanent, archival records – which will save money!

“Archival” vault should have tighter environmental control

Mixed Storage in a Large Record Center

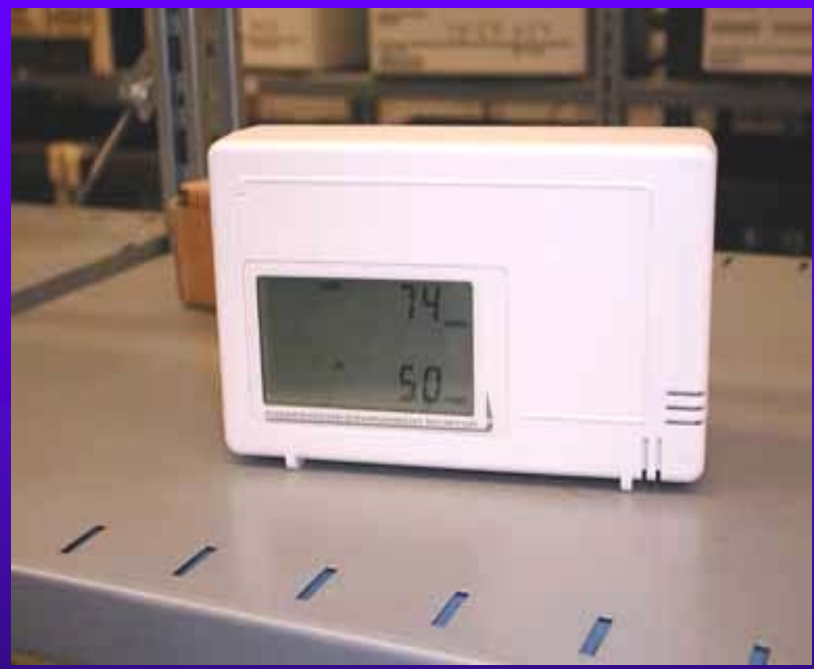
general storage ↓

long-term storage ↓

Vault Storage in a Small Facility

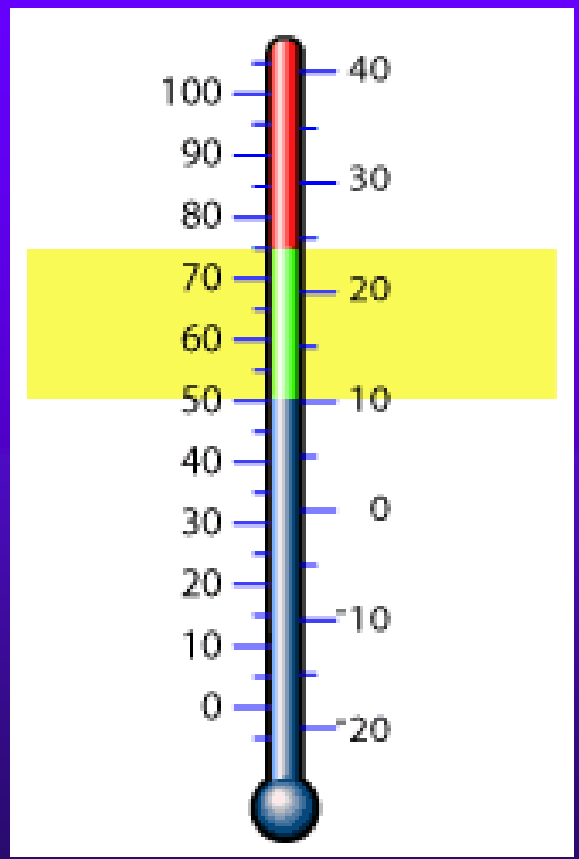
Monitoring Devices

- measures temperature & humidity to assess current conditions
- borrow dataloggers from Local Records Preservation Program (LRPP) to
  - identify problems to fix
  - identify the "better" spaces so you can store your long-term records there
- LRPP conservators can provide data analysis



Controlling Temperature

- avoid basement & attic storage
- keep temperature as low & stable as possible and feasible
- install/upgrade air-conditioning
  - preferably centralized
  - LR grants for room-size units



Controlling Humidity

- avoid basement & attic storage
- paper is happy at low humidity -- even 20-30% is good

Dehumidification

- Install dehumidifiers for summer use
  - Don't rely on the "collecting tray"; install a drain line
  - Check drain periodically to be sure it's clear
  - Locate it out of aisles and walkways
- LR grants may be available for purchase of some devices

Furnace

- inspect furnace annually – especially if it's an older one
- install carbon monoxide detectors – they could save lives

Dirt and Pollutants

- Industrial pollutants increase acid formation in paper and speed its deterioration
- In **h**eating/**v**entilation/**a**ir-**c**onditioning (HVAC) systems, buy the best filtration you can afford
- Dirt/dust is a breeding ground for insects, so change filters regularly

No Smoking in the Record Center!

Light

The Effects of Light

- weaken paper fibers
- contributes to “brittleness” of paper
- bleaching, yellowing, and/or darkening
- fading or color change

Light

- **All** light is damaging
- The damage from light is *cumulative* and *irreversible*
- Ultraviolet (UV) light is especially harmful; it is strongest in sunlight and fluorescent light

Recommended Limits

- visible light: no more than 55 lux (5 foot-candles)
  - can measure with a standard photographic light meter
- ultraviolet light: 75 microwatts per lumen
  - requires special UV light monitor

Controlling Sunlight Exposure

- Sunlight is worst, so avoid exposing records to direct sunlight
- In public areas, where aesthetics matter:
  - use blinds or drapes
  - attach “ultraviolet-filtering film” to windows

Fluorescent Light Controls

1. buy low-UV fluorescent bulbs
2. install UV-filtering film on the light diffuser panels
3. use UV-filtering "sleeves" on the tubes

Lighting over Fixed Shelving

- Locate lights over aisles, not over shelves
- Run light fixtures *parallel* to shelves

Lighting over Compact Shelving

- Light fixtures should run *perpendicular* to shelves

Lighting the Storage Area

- for cost-savings
  - "zone" the lights to avoid lighting the entire area all the time
  - keep lights off as much as possible
- locate light fixtures 14" above the highest box or shelf

Integrated Pest Management

Don’t let this happen to your records!

Pest Control Policies

“Quarantine” Space

- provide a “quarantine room” for incoming collections
  - low temperature, low humidity
  - keep incoming collections here for 2-4 weeks before bringing them into the record center
  - bugs will leave this room and not go into your record center

Pest Control Strategies

- eliminate sources of moisture
  - locate and eliminate all water sources (leaky sinks, pipes, etc.)
  - if bugs don't have a water source, they will leave the building

Pest Control Strategies

- storage practices
  - avoid storage of cardboard, which is a favorite hiding-place for silverfish

Food & Drink

- do not allow food or drink in the record center
- keep trash in tight-fitting containers
- remove all trash from the building every evening

Pest Monitoring

- Establish a regular program for monitoring pests in the record center
- Don’t let the situation get out of hand … as it did here!

Shelving & Storage

Shelving and Storage Furniture

- use metal – preferably steel – shelving
- avoid wooden shelving & storage units
  - wood accelerates aging of paper because of acidic components
  - wood is highly combustible, accelerating the spread of fire
- Local Records Program grants can support purchase of standard metal shelving for storage of public records

Shelving and Storage Furniture

- metal vs. wood
- finishes
  - purchase baked-enamel or powder-coated finishes
  - other varnishes/paints may pose a problem
- for further information, see
  - "Storage Furniture: A Brief Review …" at http://www.nedcc.org//plam3/manual.pdf
  - "Guidelines for Selecting & Using Coatings" at http://www.cci-icc.gc.ca/document-manager/view-document_e.cfm?Document_ID=333&ref=co

Standard Metal Shelving

- Use standard, steel shelving – the stronger, the better
- 13- to 16-gauge steel is generally recommended
- Avoid units that have wooden shelves!

Specialized Storage

- map cabinets, microfilm cabinets, and so on should also be made of metal, with baked-enamel or powder-coated finish

Other Shelving & Storage Decisions

- fire-proof cabinets -- may have more cons than pros; consult Local Records Program staff for details
- many vendors are listed at http://www.sos.mo.gov/archives/localrecs/conservation/vendor/vendor.asp

Compact (Mobile) Shelving

A great solution for tight quarters!

Compact Shelving

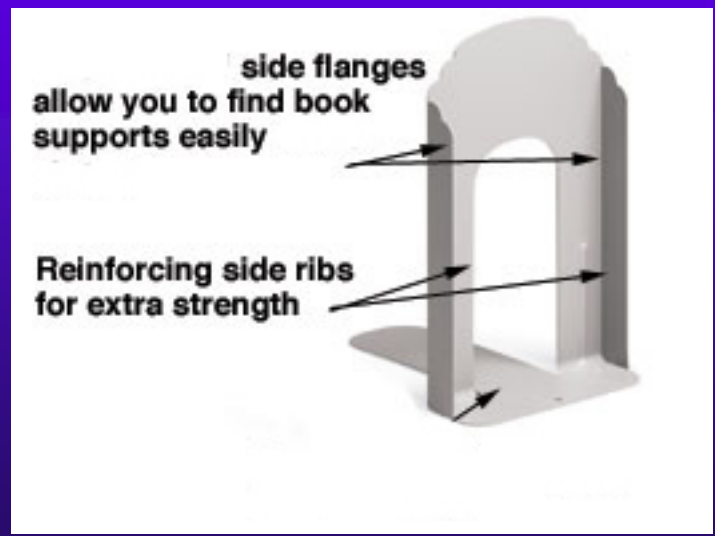
- great solution for storage areas with limited space
- provides increased security via “keypad access”
- may be operated manually or (more expensive) electrically
- is more expensive than conventional shelving

Shelving/Storage Units

- avoid shelving along exterior walls. At least keep boxes 6” away from exterior walls

Shelving of Books

- employ proper removal/reshelving methods
- shelves should be no more than 80% full
- use “non-knifing” (“wide-profile”) bookends



Oversized Storage

- flat is preferable
- short stacks!

Flat Storage of Oversize Materials

- store in stacks of no more than 4 volumes per stack
- “roller” shelves are helpful
- when using fixed shelves, allow some empty shelves to facilitate staff handling

Oversized Storage

- rolled items deserve better than this

Oversized Storage

- These are better

Other Storage Issues

- reduce storage of hazardous materials in the building
  - gasoline or gas-powered equipment
  - paint & solvents
  - flammable cleaning supplies

Loading Dock

- provide a covered area for loading & unloading records, to protect them from rain and snow during transfer

Box Transport

- In a large facility, allow space for forklift, pallet-jacket, and transporting loaded pallets

Use Policies

Live Plants in the Building

- Just say “NO!”
- They harbor insects
- Someday, you’ll over-water them and end up with water on the floor or records

Establish User Guidelines

- pencil only
- no writing/tracing atop documents
- no “sticky notes”
- book “snakes” or other weights

Training

- provide hands-on training of staff and volunteers
- educate/correct users in research room
- offer public programs for users to build greater understanding of preservation issues

Fire Protection

Fire Protection -- Dire Statistics

- 77% of fires attributed to arson
  - clear link to security
- When do fires occur?
  - 70% start between 9:00 p.m. and 9:00 a.m.
  - another 18% between 5:00 p.m. and 9:00 p.m.
- Therefore, automatic detection -- wired to a central monitoring station -- is *essential!*

Fire Detection

- manual pull alarms are only useful for saving lives -- not collections
- install automatic detectors
  - smoke
  - ionization – a.k.a. products of combustion

Fire Suppression: Extinguishers

- types: make sure you have ABC type
- locations: be sure they're near all exits
- inspection must be regular & thorough
- provide staff training, so everyone knows how to use them

Fire Suppression Systems

- Sprinklers are the best fire-fighting strategy!
- Only 1 in 1,000,000 sprinkler heads malfunction!
- Modern systems quite superior to early “deluge” systems
- Most fires are extinguished by just ***one*** sprinkler head
- Sprinklers minimize damage to records

Fire Suppression Systems

- wet-pipe:
  - simplest to install & maintain
  - fastest reaction
- dry-pipe: for unheated buildings
- pre-action: complex to install and maintain
- insurance savings will offset installation cost

Gaseous Fire Suppression

- these water-free systems (like FM200) act to "neutralize" the oxygen available to a fire

Gaseous Fire Suppression

- Halon systems now prohibitively expensive
- alternatives to Halon
  - FM-200 emerging as leader
  - water mist technologies hold promise
  - technical information at http://www.harc.org/

For solid guidance on fire protection …

- Read ***An Introduction to Fire Detection, Alarm, & Automatic Fire Sprinklers*** **at** http://www.nedcc.org/plam3/tleaf32.htm
- and work closely with your Fire Marshal and local Emergency Management Agency

Protection against Water Damage

Water Damage

- most archival disasters involve water damage, so protection against water damage is money well spent

Drainage

- consider where water can enter the building
- this drain … at a doorway … located below-grade … is an invitation to disaster

Other Design Issues

- location of water-carrying pipes
- investigate signs of leaks (like this one)
- problems with basement storage

Protection against Water Damage

- conduct regular preventive maintenance
  - roofs
  - plumbing systems

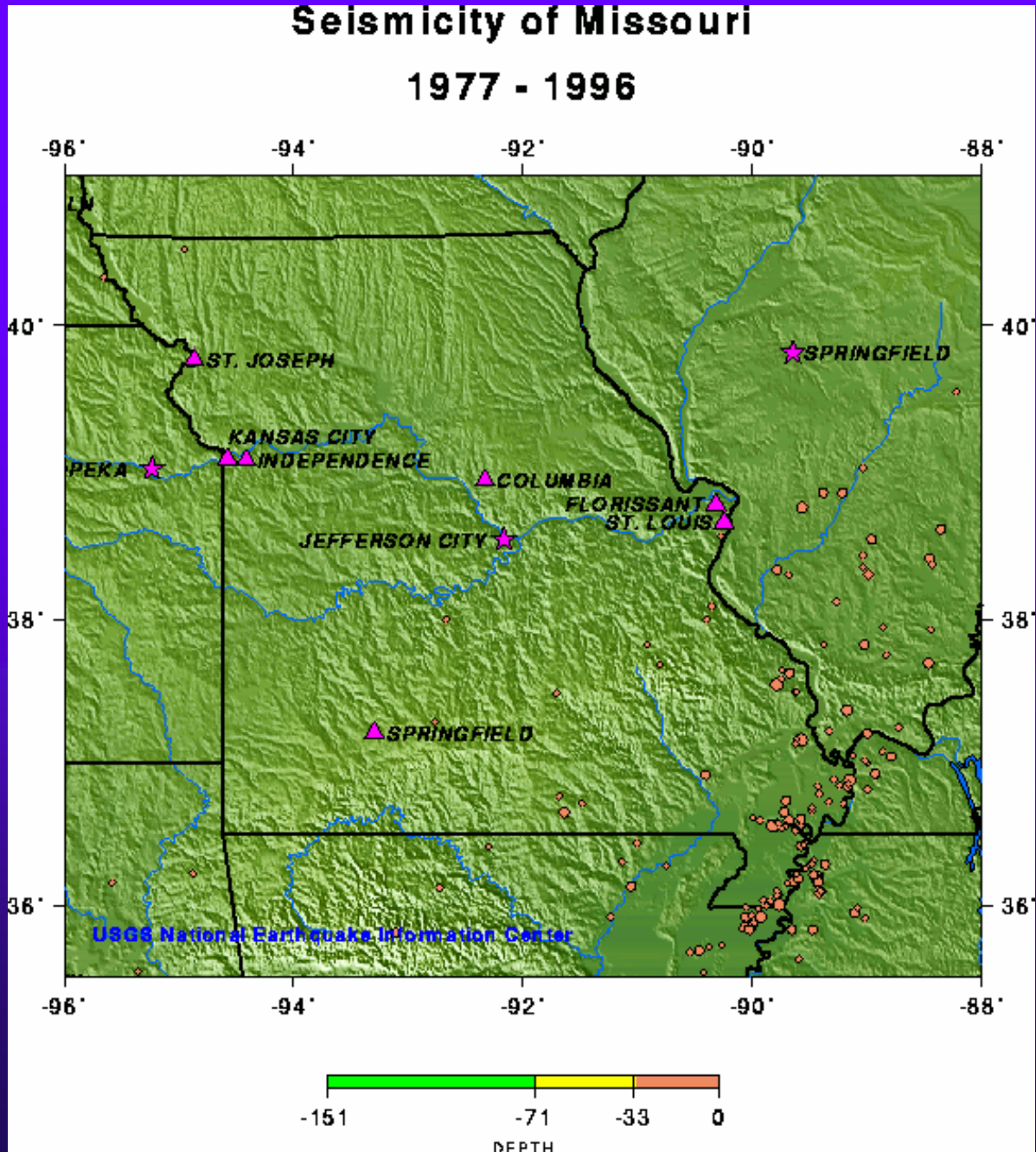
Protection against Water Damage

- ***never*** store records on the floor – 4” above floor; use pallets if nothing else
- boxes, cabinets, etc. provide some defense against leaks

Water Detection

- Water Alerts for floors
- Ceiling Guard above drop-ceilings

Earthquake Protection


Seismicity of Missouri
1977 - 1996
-96°
-94°
-92°
-90°
-88°
40°
38°
36°
ST. JOSEPH
KANSAS CITY
INDEPENDENCE
PEKA
COLUMBIA
FLORISSANT
ST. LOUIS
JEFFERSON CITY
SPRINGFIELD
SPRINGFIELD
USGS National Earthquake Information Center
-151
-71
-33
0
DEPTH

Earthquake Preparedness

- Brace shelves & fixtures to protect people and collections
  - follow California seismic standards in building design/construction!
  - channel-bracing
  - shelving units bolted into floors

Security

Secure the Facility

- 77% of fires in cultural institutions are attributed to arson!
- The records center is an easy target, so take all possible precautions to protect the facility

You can't get much safer . . .

Building Security

- Building/perimeter security
  - exterior lighting
  - window/door locks
  - guards
  - electronic (ADT, Sonitrol, etc.)
- Changing locks
- Motion detectors
- Glass-break alarms

Research Room Security

- provide lockers outside the research room, so all briefcases, purses, etc. can be left there
- arrange room so staff have a clear sight-line to observe researchers

Exhibition

Exhibit Methods

- cases--metal, not wood
- lighting
  - from outside
- temperature & humidity
  - monitor
  - controls
- pests -- monitor

Exhibit Practices

- no exhibit should be on display more than 3 months
- provide adequate supports for all items

Planning

Renovation Prospects

- consider: library, bank, grocery store, or other buildings – especially those with “open” floor plans and high load-bearing capacity

New Construction

- be prepared for all the headaches of new construction
- purpose-built facility has its advantages

New Construction

- a “Butler” building may suffice
- weigh the real costs of renovation; new construction may be cheaper

Hit The Road!

- Visit counties that have established archives or record centers. A list is available from the Local Records staff
- Explore models for construction/renovation, funding, staffing, policies and procedures, etc.
- Contact the Local Records Preservation Program for further guidance

For further information:

Local Records Preservation Program

P. O. Box 1747

Jefferson City, MO 65102

(573) 751-9047

http://www.sos.mo.gov/archives/localrecs