

# INDIANA HISTORICAL SOCIETY COLLECTIONS ADVISOR

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## Environmental Monitoring for Collections

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Objects in our collections are impacted by their storage environments and by any changes in those environments. In order to provide the best care that we can, it is important to know what affects our objects and how to monitor environmental conditions.

Below are the suggested levels for some of the major contributors to degradation in museum collections. When faced with the question of what to do with an object, a conservative approach to the environment is usually best.



## **Light**

Light levels are measured in lux (lumens per square meter) or footcandles (1 footcandle = 11 lux). UV light is the most damaging, but all light can cause embrittlement, discoloration, bleaching and fading and other issues for collections items. The recommended light level for light sensitive items is approximately 50 lux.

### Items most sensitive to light:

- Books
- Costumes and Textiles
- Dyed materials
- Feathers
- Film
- Fur
- Ink
- Leather
- Paper
- Photographs
- Prints and Drawings
- Watercolors
- Wood

### How to monitor?

Monitor using a light meter, a device used to measure light in a specific area. Take readings in several locations and throughout the day (when the light level is affected by natural light). To generally detect whether UV light is present in the galleries, UV light detecting beads can be useful.

## **Temperature**

Temperature can negatively impact collections, whether it is too hot, too cold, or shifting too quickly. Collection objects tend to like different temperatures, but most can be quite happy with a consistent temperature between 64° and 75° F (68° to 77° F is considered room temperature) as long as the temperature does not fluctuate too quickly or too frequently (+/- 5° F). Note that the higher the temperature is, the faster chemical reactions and natural degradation can occur. Thus, it is recommended to keep storage areas at colder temperatures (64°-68° F), while understanding that areas occupied by people, such as exhibit galleries, will need a slightly higher temperature to accommodate human comfort.

### Items preferring colder temperatures:

- Film (especially nitrate, acetate or color) = <32° F
- Fur = 34° to 55° F

### How to monitor?

A simple mounted thermometer or thermostat can provide an accurate enough reading. Monitor storage areas and visitor areas separately when possible. Hygrothermographs, for measuring temperature and relative humidity in a single chart, or electronic dataloggers, devices that measure environmental conditions over time, can also be used to monitor both temperature and relative humidity.

## **Relative Humidity**

Relative Humidity (RH) refers to the percentage of water vapor the air is holding compared to the total percentage of water vapor the air can hold. The percentage of RH is, as the name suggests, relative to the temperature, meaning warmer air can hold more moisture than colder air. Higher RH can result in faster deterioration of objects, some directly, like the

corrosion of metals, and others indirectly, such as mold growth (the potential for growth increases above 65% RH). On the other hand, RH that is too low can cause issues such as cracking wood and flaking emulsion on photographs. Great fluctuation in RH can speed up degradation as it encourages objects to be in a constant state of absorbing and releasing water. As a general rule, keep RH between 30% and 50% with daily fluctuations below 3% and seasonal fluctuations below 10% (the shift should be made slowly).

#### Items requiring lower RH:

- Archeological Materials, especially unstable metal and items with salt deposits
- Remains (human or animal)

#### How to Monitor?

Hygrothermographs and electronic dataloggers, as mentioned above, monitor both temperature and RH. Other devices to measure just RH include psychrometers and hygrometers. These monitoring devices can be purchased from many archival supply vendors.

Remember, most damage is cumulative and irreversible. It is also a combination of the duration of time in less-than ideal conditions, as well as the intensity of those conditions. So, be careful when handling, storing, and exhibiting items. Make sure they have adequate time to "rest" in the best conditions available between exhibitions. Consider tracking how much time an object can spend in less ideal conditions and note this in the object's record. This can ensure the items on exhibit or loan are regularly rotated.

## Further Resources

- [Collections Advisors](#) (Indiana Historical Society)
- [National Parks Service](#) (Museum Collection Environments)
- [Preservation Leaflets: The Environment](#) (Northeast Document Conservation Center)
- [Protection From Light Damage](#) (Northeast Document Conservation Center)
- [Timely Tips](#) (Indiana Historical Society)

## Collection Trainings

#### [Exhibiting Your Collections](#)

**February 1** (Northeast Document Conservation Center)

#### [How to Build Resilience: Climate Impacts and Cultural Heritage](#)

**February 8** (Conservation Center for Art and Historical Artifacts)

#### [Caring for Scrapbooks](#)

**February 15** (Northeast Document Conservation Center)

#### [Creative Solutions for Accessibility](#)

**February 15** (Conservation Center for Art and Historical Artifacts)

## Webinars

- [Local History Services Recorded Webinars](#) (Indiana Historical Society)
- [DIY Preservation: From Monitoring to Management](#) (Conservation Center for Art and Historical Artifacts)

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