

## Chapter 5: Collections Environment

*The ideal environment includes controlled temperature and relative humidity, clean air with good circulation, controlled light sources, and freedom from biological infestation.*

–*IFLA Principles for the Care and Handling of Library Material*, International Federation of Library Associations and Institutions, 1998

*The Accreditation Commission expects that the museum...takes pro-active measures to mitigate the effects of ultraviolet light, fluctuations in temperature and humidity, air pollution, damage, (and) pests....*

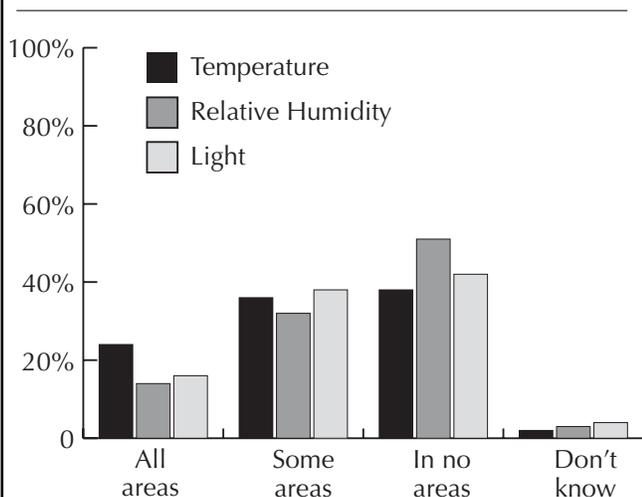
–*A Higher Standard: Museum Accreditation Program Standards*, American Association of Museums, 2005

The Heritage Health Index asked institutions to report on environmental controls in areas where the collections are held. Protection from extremes and harmful fluctuations in temperature and relative humidity, as well as from exposure to light, is fundamental to the care of collections. The exact specifications vary depending on the media or fragility of collections. The ability of institutions to provide strictly controlled collections spaces also varies and may be an unrealistic expectation for some institutions. Furthermore, even the most sophisticated climate control system may become ineffective if it is not carefully monitored and maintained. Given the length limitations of the Heritage Health Index, the Working Group members suggested that broadly stated questions would accommodate all types of collections and institutions and effectively gather data on whether institutions are considering the environmental conditions of collections.

Survey respondents were asked whether they used environmental controls to meet 1) temperature, 2) relative humidity, and 3) light level specifications for the preservation of their collections. “Specifications for preservation” was intentionally not defined to allow institutions with all levels of preservation expertise and facilities to select the response most accurate for them. As throughout the survey, response options included a mid-range between “yes” and “no”—“in some but not all areas.”

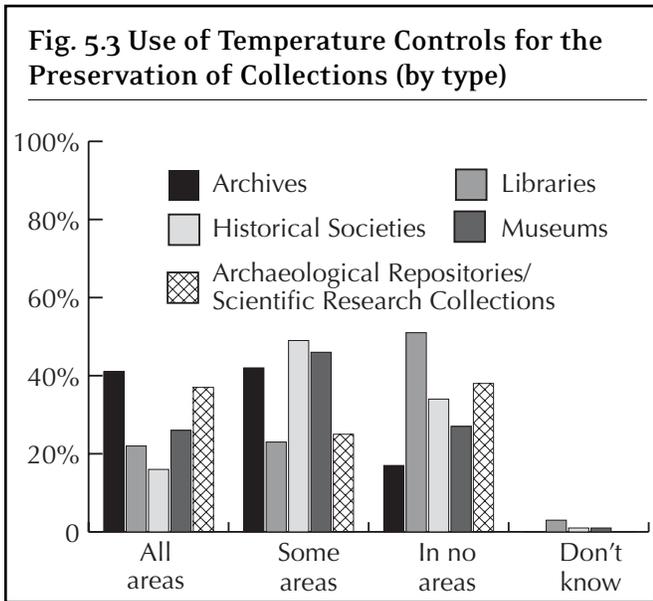
Figure 5.1 illustrates the responses for temperature, relative humidity, and control of light levels. In institutions that employ environmental controls in all or some areas where collections are held, temperature is more likely to be controlled than relative humidity or light. Of the institutions in figure 5.1 that do not control temperature, relative humidity, or light levels in any areas, 26% do not have control for all three factors; figure 5.2 shows these results by type of institution.

**Fig. 5.1 Institutions’ Use of Environmental Controls for the Preservation of Collections**

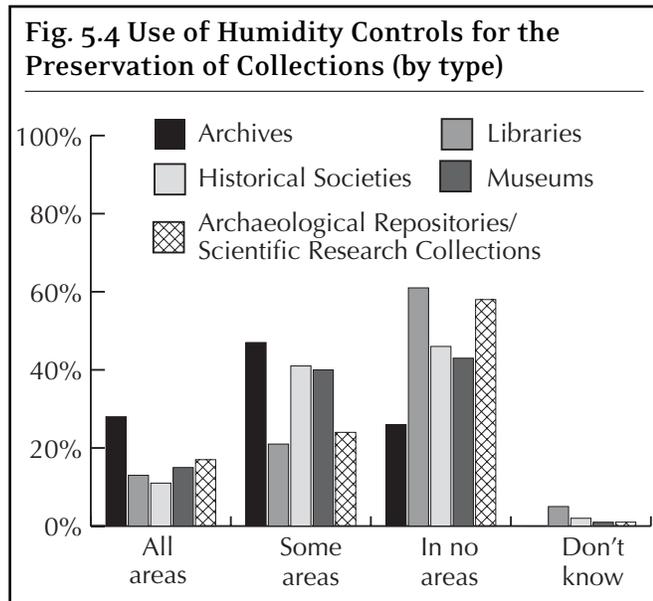


**Fig. 5.2 Institutions Using No Environmental Controls for the Preservation of Collections (by type)**

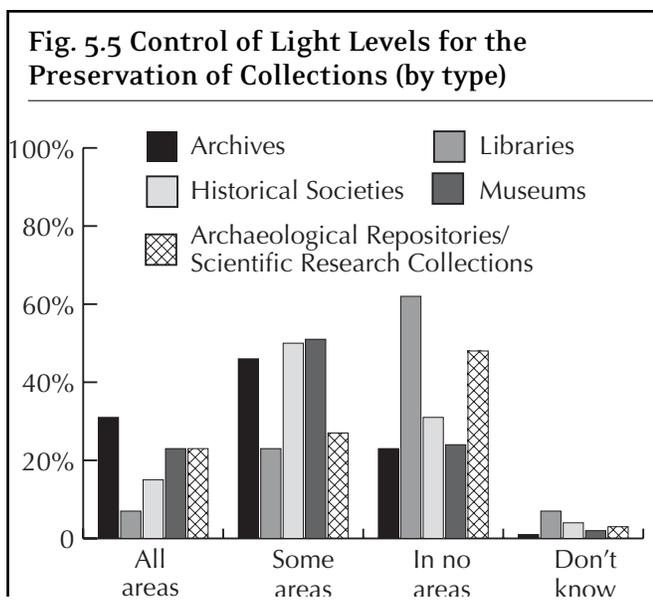




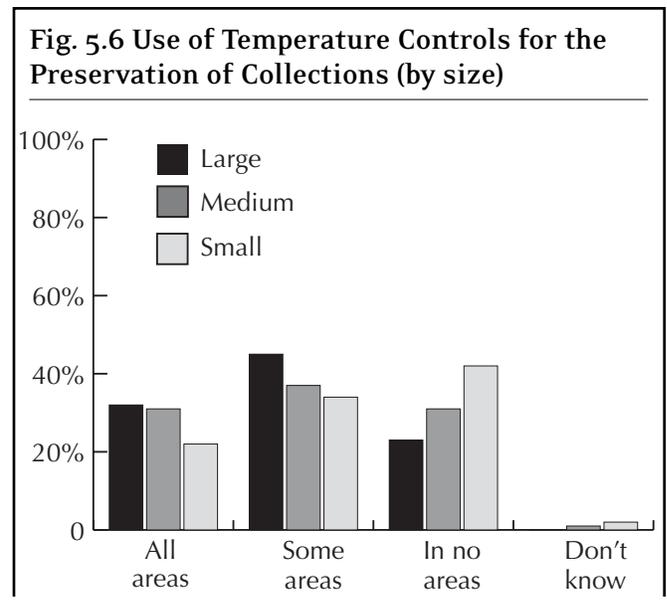
When considering each environmental factor individually (figures 5.3, 5.4, and 5.5), archives lead in providing environmental controls in all areas where collections are held. However, the results are based on a small universe of stand-alone archives; when combined with all institutions that have an archival function, the results drop: for control of temperature in all areas from 41% to 25%; for control of relative humidity in all areas from 28% to 15%; and for control of light levels in all areas from 31% to 14%. Libraries, followed by archaeological repositories/scientific research collections, were most likely not to use temperature, relative humidity, or light level controls.



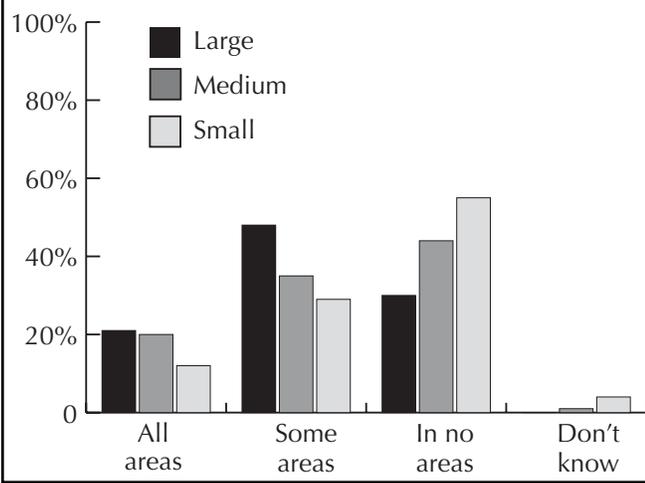
The use of environmental controls correlates to size of institution (figures 5.6, 5.7, 5.8, and 5.9), with large institutions more likely to control temperature, relative humidity, and light levels in all and some areas that hold collections, and small institutions most likely not to use environmental controls in any areas. That 27% of small institutions do not control temperature, relative humidity, or light levels in any areas contributes significantly to the 26% national average. However, it is significant to note that almost one-fifth of large institutions do not use environmental controls in any areas (libraries and archaeological repositories/scientific research collections account for much of this figure).



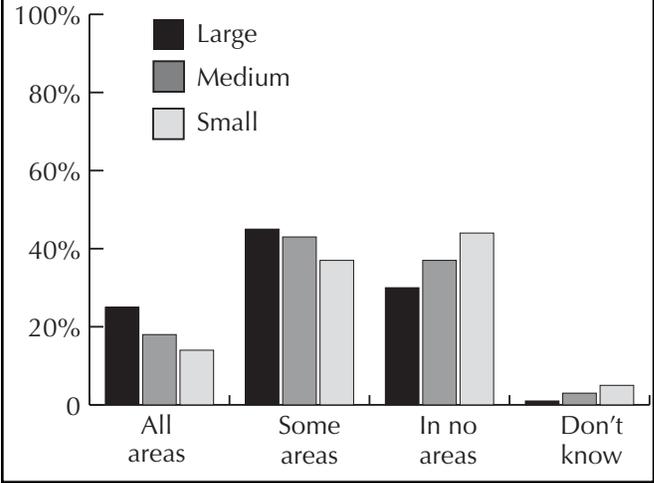
Viewing the data by region (figure 5.10) shows institutions in the Southeast are more likely to



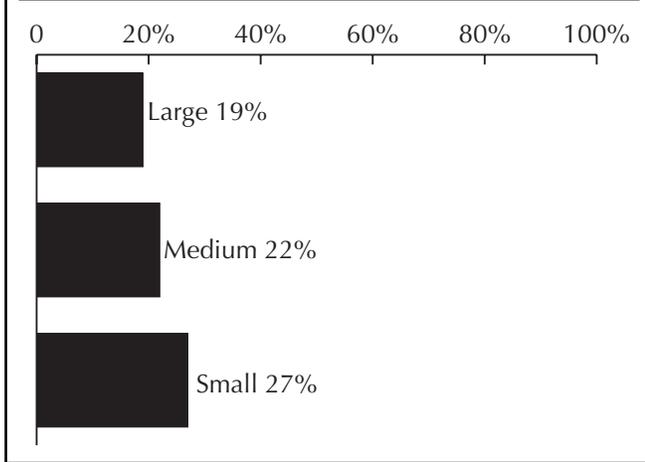
**Fig. 5.7 Use of Humidity Controls for the Preservation of Collections (by size)**



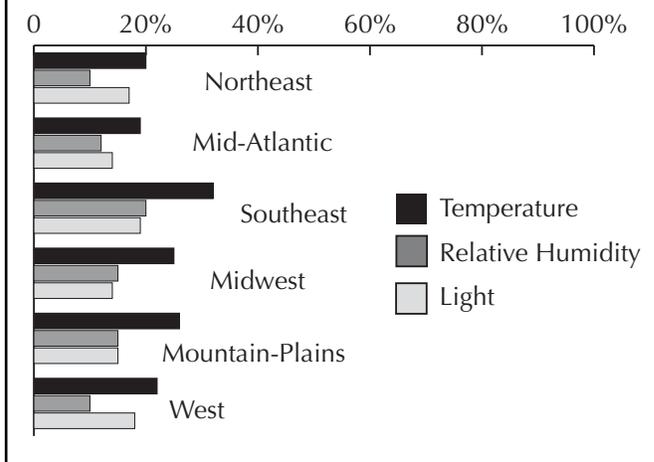
**Fig. 5.8 Control of Light Levels for the Preservation of Collections (by size)**



**Fig. 5.9 Institutions Using No Environmental Controls for the Preservation of Collections (by size)**



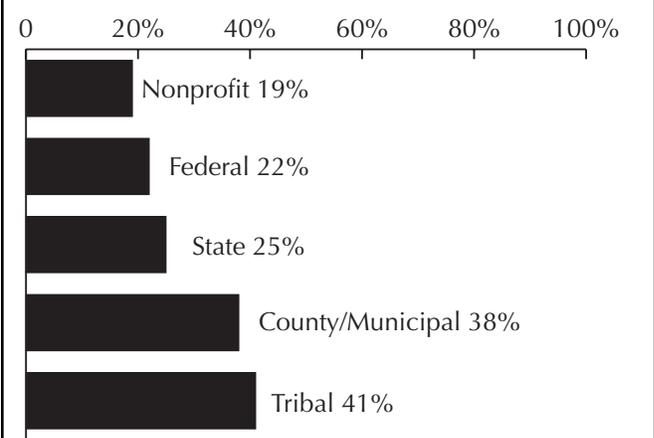
**Fig. 5.10 Use of Environmental Controls in All Areas Where Collections Are Held (by region)**



control temperature in all areas (32% compared with the national average of 24%) and relative humidity (20% compared with 14%). Data on the control of light levels does not differ as significantly by region.

When the data is analyzed by governance (figure 5.11), institutions under tribal governments or county/municipal governments are more likely to have no environmental controls in place for temperature, relative humidity, and light levels (41% and 38%, respectively) compared to the national average of 26%. Nonprofit and federal institutions fall below the national average with 19% and 22%, and state institutions are about on average at 25%. Question D12 in the Heritage

**Fig. 5.11 Institutions Using No Environmental Controls for the Preservation of Collections (by governance)**



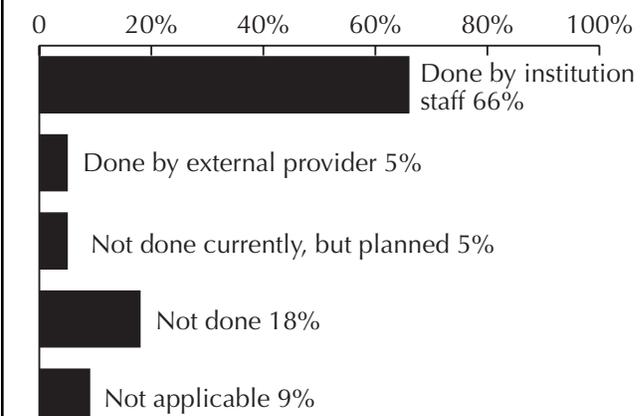
**Fig. 5.12 Institutions with Urgent Conservation/Preservation Needs<sup>2</sup>**

Environmental controls	19%
Finding aids/cataloging collections	17%
Condition surveys/assessments	14%
Conservation treatment	13%
Staff training	12%
Security	9%
Reduce exposure to light	9%
Integrated pest management	8%
Preservation of digital collections	7%

Health Index questionnaire asked institutions to rate various conservation/preservation activities by level of need using “no need,” “need,”<sup>1</sup> “urgent need,”<sup>2</sup> “don’t know,” and “not applicable.” The question included environmental controls (defined with examples of heating, air conditioning, de-humidifying, and humidifying) and improvements to reduce collections’ exposure to light. As shown in figure 5.12, environmental controls are cited as the most urgent need at 19%; the urgent need to reduce exposure to light is 9%. When combining “need” and “urgent need” for environmental controls and reduced exposure to light, the results are 63% and 49%. About a quarter of museums and historical societies state an urgent need for environmental controls, more than other types of institutions. Historical societies have the highest urgent need to reduce light levels at 13%.

Of the institutions that do not control temperature in any areas, 67% state a need or urgent need for environmental controls, but 17% claim no need and 9% don’t know, indicating that about a quarter of institutions may not appreciate the connection between environmental conditions and long-term preservation of collections. The results are only slightly more promising for relative humidity; institutions that do not control relative humidity in any areas had a combined need and urgent need for environmental controls of 71%, but 16% claim no need and 4% don’t know.

Environmental controls were included in sur-

**Fig. 5.13 Institutions’ Conservation/Preservation Program Includes Preventive Conservation**

vey questions about preservation programs and causes of damage. These questions also brought in other environmental factors, such as control of airborne particulates and pests.

In survey question D10 about what is included in institutions’ preservation programs, the definition for preventive conservation incorporated environmental monitoring (figure 5.13). These activities are likely to be done by institutional staff (66%) or not at all (18%). (See the “Preservation Staffing and Activities” chapter for additional analysis of this question.)

Consistent with the findings on use of environmental controls, libraries are least likely to have institutional staff involved in preventive conservation at 53%. The results are most influenced by public libraries at 45% and special libraries at 57%; 76% of academic libraries and 62% of independent research libraries have institutional staff involved in preventive conservation. The rate for archives is 88%, archaeological repositories/scientific research collections 86%, and museums 77%. The results on whether conservation/preservation programs include preventive conservation relate to size, with larger institutions more likely to be involved in preventive conservation activities.

Environmental controls were also part of survey question D13, which asked institutions to

1. Need defined as improvement required to reduce risk of damage or deterioration to collections.

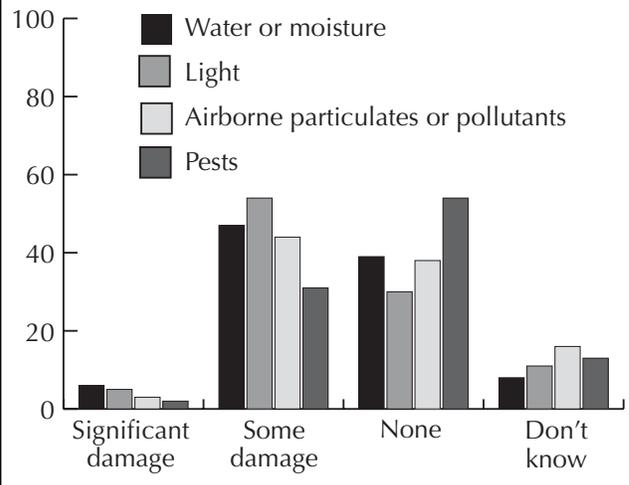
2. Urgent Need defined as major improvement required to prevent damage or deterioration to collections.

**Fig. 5.14 Institutions Reporting Causes of Significant Damage to Collections**

Improper storage or enclosure	7%
Water or moisture	6%
Light	5%
Obsolescence of playback equipment, hardware, or software	4%
Airborne particulates or pollutants	3%
Handling	3%
Pests	2%
Prior treatment(s) or restoration	2%
Vandalism	1%
Fire	.04%

identify the causes of damage or loss of access to collections currently in need of treatment. Respondents indicated whether “no damage or loss,” “some damage or loss,”<sup>3</sup> or “significant damage or loss”<sup>4</sup> has occurred. Factors included water or moisture (with examples of mold, stains, or warping), light (with examples of fading, discoloration), airborne particulates or pollutants (with examples of dust, soot), and pests. Figure 5.14 shows that water or moisture and light fall in the top four causes of significant damage (6% and 5%). When significant and some damage are combined, the figures are 53% and 59%. The data from this question underscores how prone collections can be to environmental damage; however, it should be noted that some collections might

**Fig. 5.15 Institutions Reporting Causes of Damage to Collections from Environmental Factors**



have sustained damage before coming into an institution’s care.

Airborne particulates and pests have caused significant damage to collections at only 3% and 2% of institutions, respectively. When combining significant and some damage, the results are 47% and 33% (figure 5.15). However, the response “don’t know” is high in these categories (16% and 13%). The level of need for integrated pest control (defined as approaches to prevent and solve pest problems in an efficient and ecologically sound manner) is among the lowest ranking urgent needs at 8% and also one of the lowest ranking needs when combining urgent and some need (46%).

**Recommendation**

Based on these findings, Heritage Preservation recommends that institutions give priority to finding solutions that will place as many of their collections in proper environmental conditions as possible.

3. Some damage or loss defined as change(s) in an item’s physical or chemical state requiring minor treatment.  
 4. Significant damage or loss defined as change(s) in an item’s physical or chemical state necessitating major treatment or reformatting or resulting in total loss of access.

