Preventive Conservation and the Role of the Environment
Today’s webinar

- Funding provided by the National Endowment for the Humanities Education and Training grant

- Series I: Environmental Management
  - Second webinar: August 15, 2019
IPI is an academic research center in the College of Art and Design at the Rochester Institute of Technology (RIT) dedicated to supporting the preservation of cultural heritage collections in libraries, archives, and museums around the world.
Your Presenter

Kelly M. Krish
Preventive Conservation Specialist
kmkpph@rit.edu
Environmental Management: Phases

- Set-up
- Data collection
- Data analysis
- Evaluate options
- Institute actions
Environmental Management: Phases

- **Set-up**
  - Understand the problem
    - Why is the environment important?
  - Assemble documentation
  - Build team
  - Define objective
  - Deploy instrumentation
Preventive conservation encompasses “actions taken to minimize or slow the rate of deterioration and to prevent damage to collections”.

Preventive Conservation

American Institute for Conservation Code of Ethics:

“recognize the critical importance of preventive conservation as the most effective means of promoting the long-term preservation of cultural property.”

Preventive Conservation

- Reduces loss
- Reduces interventive treatment
- Extends effectiveness of treatment
10 Agents of Deterioration

Physical forces
- Fire
- Pests
- Light
- Incorrect RH

Thieves and vandals
- Water
- Pollutants
- Incorrect temperature

Inherent vice
- Dissociation
Physical forces
- Fire
- Water
- Dissociation
- Thieves and vandals
- Pests

Pollutants
- Light
- Incorrect RH
- Incorrect temperature

Chemical

Discrete  Continuous
What can harm my collection?
Pollutants

Incorrect RH

Incorrect temperature

Thieves

Pests

Water
10 Agents of Deterioration

Physical forces
- Fire
- Pests
- Light
- Incorrect RH

Thieves and vandals
- Water
- Pollutants
- Incorrect temperature
- Dissociation
10 Agents of Deterioration

- Incorrect temperature
- Incorrect RH
- Pests
- Light
- Pollutants
- Dissociation

Magnitude of risk
Temperature

Relative Humidity (RH)

Dew Point
Environment: Dew Point

Air Temperature

55°  60°  65°  70°  75°  80°

Capacity to hold water

Air Temperature

55°  60°  65°  70°  75°  80°

Actual water present
Environment: Dew Point

Air Temperature

55°  60°  65°  70°  75°  80°

Relative Humidity

100%  84%  70%  59%  50%  42%

Capacity to hold water
Actual water present
Dew Point Calculator (dpcalc.org)

Starting Temp only

Temp only

With DP
Environmental Management: Phases

- Set-up
  - Understand the problem
    - Why is the environment important?
  - Assemble documentation
  - Build team
  - Define objective
  - Deploy instrumentation
Risk Assessment

Vulnerability  Exposure  Likelihood
Risk Assessment: Vulnerability

- **Object itself**
  - Materials
  - Assembly
  - History/ current state of deterioration

- **Context of object**
  - Access
  - Use
  - Significance
Risk Assessment: Materials

High temperature
- Acidic papers
- Natural materials
- Modern materials
- Adhesives

Low temperature
- Certain paintings
- Modern media
- Rubber, plastics, polymers
- Drums
Risk Assessment: Materials

High RH
- Natural materials
- Metals
- Adhesives
- Glass, minerals

Low RH
- Ivory
- Composite objects
Risk Assessment: Assembly
**Risk Assessment:**

History/Deterioration

- Noticeable physical property changes
- Autocatalytic point
- No noticeable physical property changes
- Fast
- Slow
Risk Assessment: History/Deterioration

The concept of **proofing** states that any future pattern of fluctuations similar to a past pattern will likely not cause significant **physical damage**.
Access
Use
Significance
Risk Assessment

Vulnerability  Exposure  Likelihood
Risk Assessment

Vulnerability  Exposure  Likelihood
Risk Assessment: Exposure

Policies/Procedures

Location/Site

Building

Room

Storage Housing

Object
Severity versus frequency

References

Observations
Risk Assessment

Vulnerability  Exposure  Likelihood
## Risk Assessment

<table>
<thead>
<tr>
<th>Agent</th>
<th>Situation</th>
<th>Collections</th>
<th>Frequency</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incorrect Temperature</td>
<td>Light from nearby window falling on nearby shelf</td>
<td>mostly metal objects</td>
<td>continuous</td>
<td>low</td>
</tr>
<tr>
<td></td>
<td>Reheat seems to be firing warmer in NE corner of storage space A</td>
<td>textiles are chemically deteriorating at faster rate</td>
<td>~ every 5 years</td>
<td>moderate</td>
</tr>
<tr>
<td></td>
<td>Freezer failure</td>
<td>film collection is chemically deteriorating at faster rate</td>
<td>~ every 10 years</td>
<td>high</td>
</tr>
</tbody>
</table>
Risk Assessment

Heat gain from hallway (conditioned for human comfort)

Heat coming through uninsulated window

Vents supplying warmer air than others in space

Thermostat blocked by storage furniture

Elevator adds heat
Resources

Canadian Conservation Institute (CCI)

For the 10 Agents:

For the risk guidebook:
Environmental Management: Phases

► Set-up
  ► Understand the problem
    ► Why is the environment important?
  ► Assemble documentation
  ► Build team
  ► Define objective
  ► Deploy instrumentation
Teamwork

Team members:

- Those who create the environment (Facilities staff)
- Those responsible for preservation of collections (Collections staff)
- Those who work in and around collections (Curatorial, Interpretation)
- Those responsible for administration and finances (Administration, Finance)
- Those who direct the sustainability mission and goals (Sustainability officers)
Environmental Management: Phases

- Set-up
  - Understand the problem
    - Why is the environment important?
  - Assemble documentation
  - Build team
  - Define objective
  - Deploy instrumentation
An **optimal storage environment** is one that achieves the best possible preservation of collections with the least possible consumption of energy, and is sustainable over time.
Sustainability

▶ Depends on:
  ▶ Local climate
  ▶ Building envelope
  ▶ Mechanical system
  ▶ Collection needs
  ▶ Institution’s goals

▶ Achievable with:
  ▶ Knowledge of collections
  ▶ Team approach
  ▶ Reliable data
  ▶ Experimentation
Environmental Monitoring

The goal depends on what question you are trying to answer

▶ General Sense
  ▶ What conditions is the collection experiencing?
  ▶ How does the mechanical system create the environment in my space?

▶ Specific Issues
  ▶ Why does this space always seem warmer than others?
  ▶ Why are we seeing mold outbreaks on this wall?
Environmental Monitoring: General

- Is one datalogger enough?
  - Avoid placement near outside doors, air vents, radiators, cold walls, fans, computers, or other sources of heated, cooled, dehumidified or humidified air
  - Where the collection lives
Environmental Monitoring: General

▶ Variations within and between spaces
  ▶ Stratification
  ▶ Different floors have different environmental challenges, operationally different
  ▶ Levels of control (ex. different housing)
Environmental Monitoring: Specific

- Environmental problems
  - Proximity to heat and moisture sources
Environmental Monitoring: Specific

- Mechanical systems
Collections

- Most vulnerable materials

- Objects on loan or exhibition spaces
How many dataloggers do I need?
When should I look at data?

- Data should be pulled and evaluated routinely
- One full year before moving datalogger for seasonal changes
- Periods of outdoor weather extremes, significant events
Environmental Management: Phases

▶ Set-up
  ▶ Understand the problem
    ▶ Why is the environment important?
  ▶ Assemble documentation
  ▶ Build team
  ▶ Define objective
  ▶ Deploy instrumentation

▶ Set-up
  ▶ Data collection
  ▶ Data analysis
  ▶ Evaluate options
  ▶ Institute actions
Thank you!

https://ipisustainability.org
https://www.imagepermanenceinstitute.org/