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Bridging Past and Future

Cultural Property Risk Analysis Model (CPRAM): A very brief introduction to key concepts

What is a risk?

In its simplest sense, the goal of preservation is to convey a collection from one point in time to a future time with no unnecessary damage or loss. Consider this collection of 25 objects: 5 ceramics, 5 prints, 5 textiles, 5 natural history, and 5 paintings.

The goal is to take this collection of 25 objects unharmed to a future time. We choose a starting time that is not today, or tomorrow. Instead, we choose a starting time that gives us time to plan strategically for effective preservation.

It may happen that over this time some of the objects will be misplaced and lost. Below we see that two of the objects will be lost from the collection. This loss of objects by misfiling, non-recorded loans, and so on, are departures from the goal and are, by definition, risks to the collection.

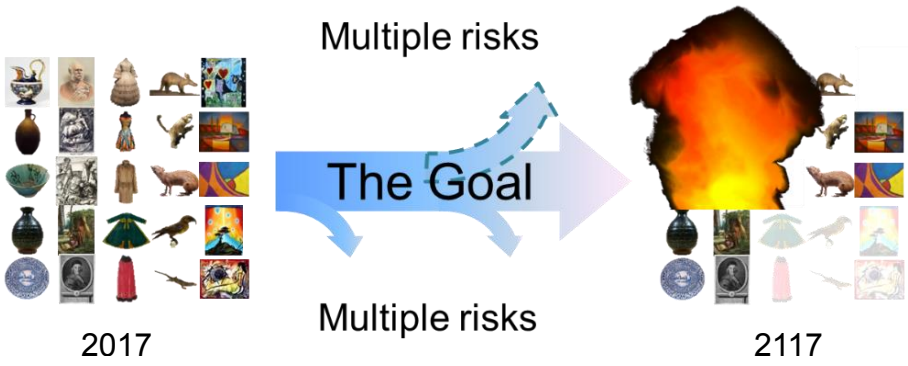
It may also happen that some of the collection is placed on exhibit for many decades; here it is the bottom, right (as viewed) 6 objects. This will result in fading of that part of the collection. This is another departure from the goal and, therefore, another risk to the collection.

In addition to these accumulating small incidents and continuing processes, there also will be a chance of all or most of the collection being destroyed in a disaster.

Risks are departures from the goal. Risks can be described as scenarios that may occur.

The goal of preservation is to move the collection forward in time without damage or loss.

Our challenge is to manage multiple risks.



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Can we identify all risks?

We can never identify every risk to a cultural property. There is always the chance of an "unknown unknown" risk, sometimes called a "black swan". Still, using a combination of "agents of deterioration" and "types of risk" we can come close to being comprehensive and can formulate some understanding how comprehensive our assessment is.

AGENT of DETERIORATION

Physical Forces

Fire

Water

Criminals

Pests

Contaminants

Light and UV Radiation

Incorrect Temperature

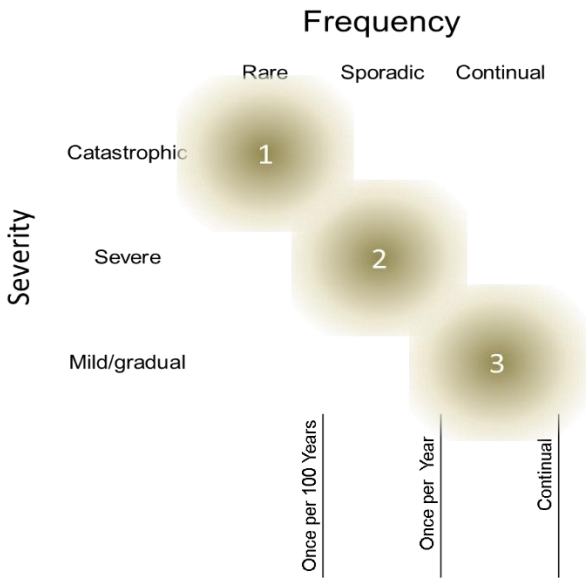
Incorrect Relative Humidity

Dissociation

After Michalski, 1990

TYPE of RISK

1. Less than 1 event expected in next 100 years
2. A few incidents per century or per decade
3. A continual process or events repeated at least once per year



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Examples of generic risks and specific risks

GENERIC RISKS	EXAMPLES of SPECIFIC RISKS
Physical Forces– Type 1	**Earthquake** causes **collapse of shelves** resulting in **broken objects**
Physical Forces– Type 2	**Error in handling** results in **dropped drawer of objects** resulting in **broken objects**
Physical Forces– Type 3	**Gravity** acting on **poorly supported, deformable objects** results in **distorted objects**
Fire– Type 1	**Fire** ignites then **flashes over** to other objects then **spreads** to other compartments to **consume building** and **destroy entire collection**.
Fire– Type 2	**Fire** ignites then **flashes over** to other objects, **consumes one fire compartment, and** destroys all objects in compartment.
Fire– Type 3	**Fire** ignites but **does not flash over** and destroys only one object at point of ignition **destroying one object**.
Water– Type 1	**Water** from **nearby river overflows banks, inundates basement** of building **wetting collections** to a 1m depth resulting in **loss of soluble parts of objects and labels**.
Water– Type 2	**Water** from **leaking downspouts runs down interior walls wets objects** hung on walls resulting in **tide mark stains on objects**.
Water– Type 3	**Water** in ground near building s**eeps through basement floor** leading to **corrosion of metal objects** stored directly on floor.
Criminals– Type 1	Professional **thieves** plan a **targeted theft** resulting in **loss of objects**.
Criminals– Type 2	**Persons given access** to collections **steal objects** or parts of objects leading to **loss of objects**.
Criminals– Type 3	**Visitors** to museum **pick at exposed objects** resulting in **partial loss of objects**.
Pests– Type 2 or 3	**Insect pests** enter collection on **returned loans** and **consume parts of objects** resulting in **losses from objects**.

Contaminants– Type 1	**Industrial or transportation accident** near museum causes **plume of contaminants** over building which **enters HVAC system** and **contaminates objects**.
Contaminants– Type 2	**Corrosive cleaning fluids** are **accidentally spilled** on collection objects resulting in **corrosion** and **surface damage to objects**.
Contaminants– Type 3	**Storage hardware** exposed to high temperature and RH **releases acidic gases** which **corrode** sensitive objects resulting in **surface damage to objects.**
Light and UV Radiation– Type 2 & 3	**Light** from UV filtered **exhibit lighting** causes **fading of object colours**.
Incorrect Temperature– Type 2	**Failure** of an ultra-cold freezer together with **failure of the alarm system** leads to **melting of samples** and **degradation of DNA**.
Incorrect Temperature– Type 3	Annual average or seasonal **temperatures too high** leading to accelerated **chemical reactions** results in progressive **disintegration of objects**.
Incorrect Relative Humidity– Type 2	**High RH excursions** due to **failure of HVAC** systems leading to **corrosion** of metals resulting in **loss of material and obscuring of objects**.
Incorrect Relative Humidity– Type 3	**Winter low levels of relative humidity** causes **dimensional change** leading to **rupture of constrained materials in objects**.
Dissociation– Type 1	**Extraordinary circumstances** lead to **collection abandonment** resulting in **complete loss of collections.**
Dissociation – Type 2	**Loss** of **collection-related documents** such as field notes through **use or non-use** results in **loss in value of objects**.
Dissociation – Type 3	**Detachment** of identifying label where label goes missing or **cannot be re-associated** leads to **loss of object value**.

Specific risks need to be well defined

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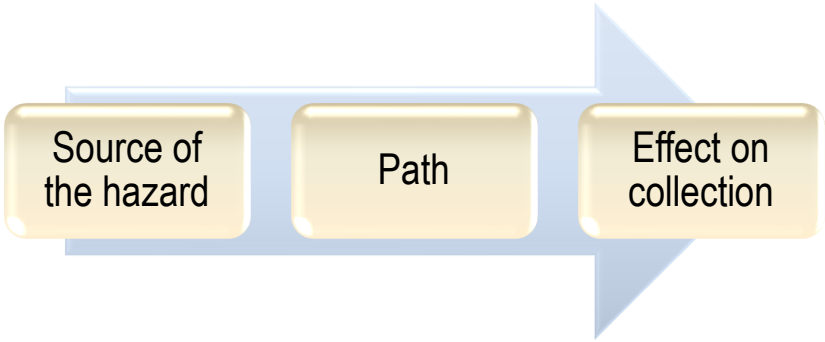

Well defined risks can be quantified

using a series of ratios:

- Magnitude of Risk (MR)
- Fraction Susceptible (FS)
- Loss in Value (LV)
- Probability (P)
- Extent (E)

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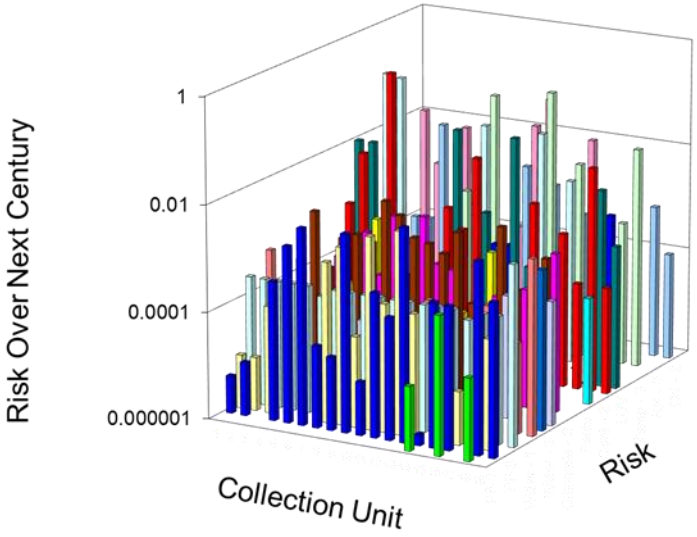
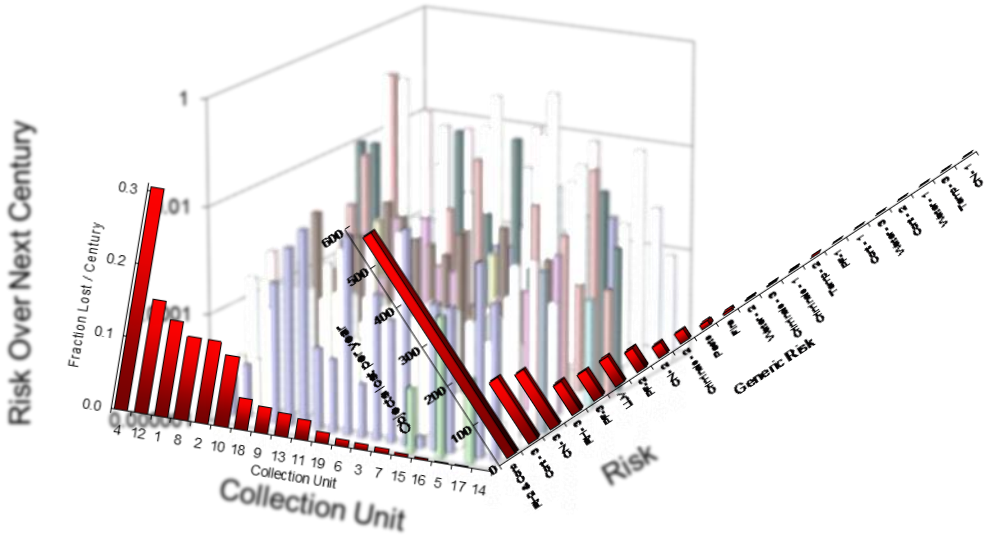
Results inform managers throughout an organization

The overall picture is a complex forest – easy to become lost …..



Looking at data from the perspective of each manager's ability to control risks clarifies issues of importance:



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Cultural property risk analysis papers available on the internet:

Robert Waller, Conservation risk assessment: A strategy for managing resources for preventive conservation. Preprints of the Contributions to the Ottawa Congress, 12-16 September 1994, Preventive Conservation: Practice, Theory and Research, A. Roy and P. Smith (Eds.), IIC, London, pp. 12-16. Copy can be found at: http://www.konservaattoriliitto.fi/060513/Offprint%201.pdf or http://www.museum-sos.org/docs/WallerOttawa1994.pdf

Robert Waller, Risk Management Applied To Preventive Conservation. pp 21-28 In: Rose, C.L., Hawks, C.A. and Genoways, H.H. (eds.). Storage of Natural History Collections: A Preventive Conservation Approach. Society for the Preservation of Natural History Collections Iowa City, x+448pp., 1995. http://www.museum-sos.org/docs/WallerSPNHC1995.pdf

Robert Waller, Preventive conservation planning for large and diverse collections. Preservation of Collections: Assessment, Evaluation, and Mitigation Strategies. Preprints of the June 10-11, 1996 workshop, American Institute for Conservation, Washington, p. 1-9, 1996. http://www.museum-sos.org/docs/WallerAIC1996.pdf

Robert Waller, Internal pollutants, risk assessment and conservation priorities. International Council of Museums, Committee for Conservation, Preprints of the 12th Triennial Meeting, Lyon, 1999, pp. 113-118. Copy can be found at: http://www.konservaattoriliitto.fi/060513/Offprint%203.pdf

Robert Waller, A risk model for collection preservation. International Council of Museums, Committee for Conservation, Preprints of the 13th Triennial Meeting, Rio de Janeiro, 2002, pp. 102-107. Copy can be found at: http://www.konservaattoriliitto.fi/060513/Offprint%204.pdf or http://www.museum-sos.org/docs/WallerICOMCC2002.pdf

Robert Waller and Stefan Michalski. Effective Preservation: From Reaction to Prevention. Getty Conservation Institute Newsletter 19(1): 4-9, 2004. http://www.getty.edu/conservation/publications/newsletters/19_1/feature.html

G. Muething, R. Waller and F. Graham. Risk Assessment of Collections in Exhibitions at the Canadian Museum of Nature. Submitted to: Journal of the American Institute for Conservation. 44(3):233-243. 2005. http://aic.stanford.edu/jaic/articles/jaic44-03-007_indx.html

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