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XX CYCLE

DISASTER RISK MANAGEMENT OF CULTURAL HERITAGE

L-ART 04

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ACRONYMS

ADPC	Asian Disaster Preparedness Center
AFRICOM	International Council of African Museums
AIB	Italian Library Association
ALECSO	Arab League Educational, Scientific and Cultural Organization
ALP	The Library (at Posieux)
ANAI	National Association of Italian Archivists
ANC	Associazione Nazionale dei Carabinieri
ANCBS	Association of National Committees of the Blue Shield
ARAAFU	Association des restaurateurs d'art et d'arquéologie de formation universitaire
BBS	Bhutan Broadcasting Services
BIEF	Information Bank of French-speaking States
BRGM	Bureau de Recherches Géologiques et Minières
CARICOM	Regional Intergovernmental Agency of the Caribbean Community
CARPS	Cellule d'Appui, de Réflexion, de Programmation et de Suivi
CCAAA	Co-ordinating Council of Audiovisual Archives Associations
CCI/ICC	Canadian Conservation Institute/Institut Canadien de conservation
CDERA	Caribbean Disaster Emergency Response Agency
CHA	Cultural Heritage Administration
CHDA	Centre for Heritage Development in Africa
CNR	Consiglio Nazionale delle Ricerche
CONAC	Consejo Nacional de la Cultura de Venezuela
CPA	Coalition Provisional Authority
CRI	Croce Rossa Italiana
DANIDA	Danish Agency for International Development
DESS	Diplôme d'études supérieures spécialisées
DNOR	National Committee for the Rova Operation
ECCO	European Confederation of Conservator-Restorers' Organisations
ECHO	European Cultural Heritage Online
EPA	Ecole du patrimoine africain
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
FUNVISIS	Venezuelan Seismological Research Foundation
GCI	Getty Conservation Institute
IAA	Israel Antiquities Authority
IAI	International African Institute
IBC	Istituto dei Beni Artistici, Culturali e Naturali
ICA	International Council on Archives
ICBS	International Committee of the Blue Shield
ICCROM	International Centre for the Study of Preservation and Restoration of Cultural Property
ICN	Institute for Cultural Heritage in the Netherlands
ICOM	International Council of Museums
ICOM-ASPAC	International Council of Museums-Regional Organisation Asia and Pacific
ICOM-CC	International Council of Museums-Conservation Committee
ICOM-ICMS	International Council of Museums-Security Committee
ICOMOS	International Council of Monuments and Sites
ICR	Istituto Centrale del Restauro

ICRC	International Committee of the Red Cross
ICOM-ICTOP	International Council of Museums-Training of Personnel Committee
IDRC	International Disaster Reduction Conference
IFLA	International Federation of Library Associations and Institutions
IIC	International Institute for Conservation of Historic and Artistic Works
IIHL	International Institute of Humanitarian Rights
INAH	Instituto Nacional de Antropología e Historia
IZS	Integrated Emergency System of the Czech Republic
MAC	Museums Association of the Caribbean
MAE-USP	Museum of Archaeology and Ethnology of University of São Paulo
MEP	Museums Emergency Programme
MGC	Museums and Galleries Commission
MSF	Médecin Sans Frontières
MUVISS	Museo dei Vigili del Fuoco e la Scuola della Sicurezza
NEMA	National Emergency Management Authority
NIC	National Institute for Conservation
NGO	Non Governamental Organisations
OCBC	Office Central de lutte contre le trafic des Biens Culturels
OPBC	Observatory for the Protection of Cultural Heritage in Critical Areas
PMDA	Programme for Museum Development in Africa
SIOI	Società Italiana per le Organizzazioni Internazionali
SIPBC	Società Italiana per la Protezione del Patrimonio Culturale
TIEM	Teamwork for Integrated Emergency Management
TPC	Tutela Patrimonio Culturale del Comando dei Carabinieri
UCL	University College of London
UEHHA	Union of European Historic House Associations
UN	United Nations
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
UNIDROIT	International Institute for the Unification of Private Law
UN-ISDR	United Nations International Strategy for Disasters Reduction
WAMP	West African Museums Programme
WCO	World Customs Organisation
WFP	World Food Programme (United Nations)
WHC	World Heritage Centre
WHO	World Health Organisation

CHAPTER I

THE RESEARCH

I.1. INTRODUCTION

Man-made and natural catastrophes have been the cause of tremendous loss of life and property. In developing countries, their impact is very often more severe. The distruction of cultural properties leaves the communities without references and common values to permit a balanced reconstruction of the affected areas.

Some recent examples of distructions that included the partial or total loss of cultural properties such as in the conflicts in Afghanistan in 2001 and Iraq in 2003, and during the earthquakes in Iran in 2003 and tsunamis of 2004 in the Indian Ocean, the hurricane in USA and the flood in Central America both in 2005, during the February 2006 the destruction of the golden dome of the Shiite Iman Ali al-Hadi Shrine in the city of Samarra in Iraq, the August 2007 earthquake in Peru and the very recent earthquake in the Abruzzi region, remind us that unfortunately catastrophes are very "democratic", because they tackle all the countries of the world and can occur in every moment. Many actions have been undertaken already by local, national institutions and international organisations dealing with the protection of cultural properties in order to make the different stakeholders aware of the fragility of their unique collections, their value for the local and international communities and their vulnerability. Many organisations continue to work in the respect of cultural diversity and with a broader scope that goes beyond the museums limits in order to include cultural heritage concerns into the global disaster risk reduction strategies and plans.

I.2. RECENT DECLARATIONS AND RECOMMENDATIONS IN SUPPORT OF THE DISASTER RISK MANAGEMENT OF CULTURAL PROPERTIES

The Kobe/Tokyo Declaration on Risk Preparedness for Cultural Heritage (Stovel 1998), which is the result of "The International Symposium on Risk Preparedness for Cultural Properties" held in Kobe/Tokyo in January 1997 was intended to guide governments to improve their ability to integrate concern for cultural heritage within existing emergency planning and response infrastructures. At the same time, it gave to international institutions, among which ICOM (International Council of Museums), the principal guidelines for starting designing and developing in 2000 a consistent programme within the context of emergency situations and to integrate the suggestions coming from interdisciplinary and multicultural specialists attending the Symposium.

In 2003, ICOM organised, under the framework of Museums Emergency Programme (MEP), the "International Symposium on Cultural Heritage Disaster Preparedness and Response" in India, Hyderabad, at the Salar Jung Museum. During the working group sessions, the participants developed recommendations[1] that are addressed to several organisations such as ICOM, the International Council on Monuments and Sites (ICOMOS), the International Centre for the Study of the Preservation and Resoration of Cultural Property (ICCROM) and to the museum community in general. Several of them concern the training and capacity building activities.

The "Kyoto Declaration on Protection of Cultural Properties, Historic Areas and their Settings from Disaster"[2] was adopted at the Kyoto International Symposium "Towards the Protection of Cultural Properties and Historic Urban Areas from Disaster" held in Kyoto Kaikan in 2005.

The "International Disaster Reduction Conference (IDRC)", special session on: "Integrating traditional knowledge systems and concern for cultural and natural heritage into risk management strategies" organised by ICCROM, ICOMOS and the World Heritage Centre (WHC) of the United Nations Educational, Scientific and Cultural Organisation (UNESCO) on 31 August 2006 in Davos, Switzerland, represents a milestone in the history of the disaster risk management for cultural heritage.

As I wrote in January 2010 in the International Committee of the Blue Shield (ICBS) Statement on the earthquake in Haiti[3]:

> "Culture is a basic need, and cultural heritage a symbolic necessity that gives meaning to human lives connecting past, present and future. Cultural heritage is a reference full of values helping to restore a sense of normality and enabling people to move forward. Cultural Heritage is fundamental in rebuilding the identity, the dignity and the hope of the communities after a catastrophe."

[1] See Annex III.a. For the consultation of the text, see the following link: http://icom.museum/disaster_preparedness_book/annex/recommendations1.pdf

[2] See Annex III.b. For the consultation of the text, see the following link: http://www.heritagerisk.org/kyoto_declaration.pdf

[3] See the following webpage for the full text of the Statement: http://www.blueshield-international.org/

For this reason, the fact that culture has finally been included into the global disater risk management issue is a very significant achievement. The meeting resulted into the "IDRC Davos 2006 Declaration"[4] where, under chapter: Education, Knowledge and Awareness, it says that:

> "Concern for heritage, both tangible and intangible should be incorporated into disaster risk reduction strategies and plans, which are strengthened through attention to cultural attributes and traditional knowledge".

The Organization of World Heritage Cities Northwest-European Regional Conference, "Earth, Wind, Water, Fire – Environmental Challenges to Urban World Heritage", held in Regensburg, Germany in September 2008, resulted into the "Regensburg Recommendation"[5]. In this recommendation, the participants of the conference, representatives of the Organisation of World Heritage Cities in Northwest Europe, emphasised the importance of safeguarding the world's cultural heritage for present and future generations, highlighting that climate change and environmental challenges like storms, flooding, fire, earthquakes, weathering, erosion and landslides pose one of the most important threats to World Heritage cities, especially given the more frequent extreme weather situations, and that the loss and deterioration of the built cultural heritage due to natural disasters and climate change affects all people.

I.3. OBJECTIVES OF THE RESEARCH

The objective of the research is to explore how from the origins of preventive conservation we are currently dealing with disaster risk management issues. Background events, such as charters, conventions, training activities, etc. are presented to show how disaster risk management discipline is supported. World wide methodologies about risk assessment, preparedness, response and recovery, and training, have been identified and presented. Most of them are still not yet systematically in use even if international institutions like ICCROM, the Canadian Conservation Institute and others, are testing them so to develop high standards that will be adapted and shaped to local and regional different contexts.

[4] See Annex III.c. For the consultation of the text, see the following link: http://www.davos2006.ch/Declaration/IDRC_Davos_Declaration_20060908.pdf

[5] See Annex III.d.

I.4. CASE STUDY AND TYPE OF RISKS

Several case studies from different parts of the world are presented in this research.

The use of case studies is justified as a support to better understand the diversity of situations that are developped in the case of a disaster.

The case study selection method is not quantitative but qualitative. For the scope of the research it was important to have a quite balanced geographical representation even if some regions, such as Asia and Europe, are more represented for circumstantial reasons.

Some examples of preparedness actions (before the catastrophe) are exposed like in the case of the World Heritage Site of Kizhi State open-air Museum of architecture, history and ethnography in the Russian Federation. Examples of response (during and just after the catastrophe) activities are descripted like in the case study concerning the fire on the South Gate of Seoul, in South Korea. Examples of recovery actions (after the catastrophe and with a long term perspective) are considered in the case of the restitution of the original landscape surrounding the archaeological site and the museum of Olympia in Greece.

Theory and practice confirm that there is no rigorous limit among the steps: before, during and after the catastrophe. In fact all of these phases have to be considered as in a cycle and sometimes are one consequence of the other or its cause. In any case, in the recovery actions, preventive and preparedness interventions are included too and serve as a connecting link of the disaster risk management chain/cycle in order to be ready in case of the next catastrophes. In addition, we can speak about readiness as a nuance of the “state” to be prepared just in the moment when the catastrophe occurs.

Different types of disasters are explored: from fire to earthquake, from lightning to tropical storms, from war to pest. In most of the case, the disasters are in a chain of interrelations too. As an example, in case of an earthquake we can have fires as a consequence caused by short circuit; and then flood caused by the water pump and extinguishers used by the fire brigade; and then pest and mould infestations because of the too high concentration of humidity in the air; and subsequently we can have the risk of dissociation, meaning with this that some objects in “crisis” circumstances could lose part of its material component and associated

value, and/or lose its inventory number or even its documentation, or be dismembered like in the case of books, manuscripts, archives, but also part of works of art. The works of art can additionally be looted if the destroyed buildings are not secured in order to avoid illicit intrusions and be found by consequence on the illegal market often very far away from the country where they were preserved and exhibited.

This kind of risk interrelation process that I also call “risk cascade phenomenon” or “risk arborescence” can be employed for a conflict and war situation too.

The only difference is that a war is predictable in advance as many factors such as political, racial, social, economical… can induce to think that it will soon go off, while an earthquake it is not even if it strikes in a earthquake prone area where people is used to live with this risk.

Response and recovery actions are quite similar in both situations and even in the collapse of a building, as we have recently seen with the case of the State Archive of Cologne, in Germany on 3rd March 2009.

It is clear that mitigation measures, in order to reduce the impact of a possible risk, or of the “next” catastrophe –in case of measures put in place during the recovery phase- that are set up in museums and in cultural heritage institutions in general, are comparable in the cases mentioned above but they differ too.

In case of earthquake (Fig.1.a. and 1.b.) prone area, fragile objects should be fixed by monofilament or special wax in the showcases but removed in case of a conflict situation (Fig.2.) and stored in a secured place. Big sculptures should be fixed to the wall or put on special pedestal to avoid big consequences of earth tremors while in case of a war they should be secured and stabilised by sandbags and wrapped by protecting plastic or other material. Paintings are fixed to the wall with special hooks in case of earthquakes while, in the case of a war, they are removed, packed and stored. Many other examples could follow, but in general we can say that in the case of a declared war, especially when museums have already been closed to the public, all collection items should be removed and secured in another place whenever possible.

Fig.1.a. L'Aquila, Museo Nazionale dell'Abruzzo after the earthquake of 6th April 2009. (©D.Jallà)

Fig.1.b. L'Aquila, Santa Maria del Suffragio after the earthquake of 6th April 2009. (©INP)

Fig.2. Bagdad National Museum distruction during the war in 2003. (© M.Tana/Getty Images)

I.5. LIMITATIONS

The research does not focus solely on a particular aspect e.g. technical, social or others. Rather, it builds on a multi and inter disciplinarity approach and on various interrelationships that demonstrate the processes that contribute to the disaster risk management of cultural properties.

Moreover, the research looks at a longitudinal time frame with respect to disaster, it does not study pre, post or emergency phase in isolation, rather it looks at the dynamics of the situation and the factors affecting that. Morevover, it is very much exploratory and inductive in its nature.

The identification of methodologies is not exhaustive. I tried to include in the research the methods that I think are more relevant especially because they have already been tested and are in a continuous process of adaptation and evaluation- such as the method that ICCROM, together with the Canadian Conservation Institute (CCI) and other institutions, is currently developping. Other methods have been added because of their originality or because of their immediate and easy usefulness.

With the choice of the case studies, as I have said, it is not intended to cover all possible types of disaster risk management events - even from the geographical point of view.

Because of limitation of time I haven't had the possibility to explore an Italian case study, such as the recent earthquake in the Abruzzi region in spite of being a member of the *Commissione Grandi Rischi* created just after the disaster.

I was moreover not exploring the Italian *Carta del Rischio*, even if during the entire research period, and in nearly all the countries (Venezuela, Vietnam, Korea, Israel, United States of America, many European countries, New Zealand, Madagascar...) that I have visited, I found reference of it with a very high consideration and respect.

In some chapters I consider physics, botany, sociology, architecture and other disciplines' concerns that are not part of my specialities. These reflections are based on number of conferences that I have attended to and especially on number of interviews that I have had the occasion and the honour to undertake. I hope that the curiosity for the interdisciplinary approach in my research will excuse me from not having deeply developped all the facts presented.

I.6. ORGANISATION OF THE RESEARCH

The risk management of cultural heritage is a topic that has been confronted in a systematic, methodological and theoretical manner at an international level only in the last 15 years. In the research undertaken, the historical origins and the evolutionary processes of preventive conservation are examined. This complex discipline encompasses not only climatic and environmental factors, but also those connected to safety, so as to arrive at an integrated disaster risk management.

The research is subdivided into four chapters.
The first chapter: "The Research", presents the objectives of the research and its general context. The aim, limits and organisation of the research work are highlighted. The selection has favoured qualitative methods and the support of case studies. The research being at international level, texts and publications in various foreign languages have been taken into consideration. It presents techniques for collecting data, making it clear in which cases

reference was made to direct observations on the field, rather than to interviews or access to documents in libraries, research centres, documentation centres, museums and the like. The theory has served to determine a conceptual apparatus to identify major interpretive frameworks for observation and comparison of case studies. The methodology takes into consideration the choices made to carry out the research, such as a balanced geographical selection of case studies, and defines the types of museums and heritage sites under consideration.

The second chapter: “Preventive Conservation versus a Disaster Risk Management”, presents the historical origins of preventive conservation, and how this discipline has found it’s positioning with respect to restoration. Several conferences and important courses that have helped this discipline to evolve over time have been listed. This is followed by an intentionally brief explanation of the different factors of deterioration that interact upon the cultural heritage. Methods of measuring and controlling each of these factors have been identified. At the end of the second chapter, the concept of risk management applied to cultural heritage is introduced, outlining some techniques for identifying and analysing these risks.

The third chapter: “Review of Theory and Practice”, presents the theoretical and practical concepts of risk management, applied to cultural heritage. Terms such as “disaster”, “risk”, “vulnerability”, “probability” and “integrated management” are defined, as well as others specific to disaster risk management. It then introduces the perception of risks and analysis of the local situation in sociological, psychological and anthropological terms in relation to the cultural heritage.
Various stages in the cycle of integrated emergency management are taken into account: “risk prevention and perparedness” being preventive actions to be implemented to avoid or minimise the impact and severity of catastrophes; “risk readiness” being immediate actions to confront the situation caused by the catastrophe; “risk response” being the coordination of actions aimed at minimising the devastating effects created by the catastrophe; and “risk recovery” being the programme of actions to rectify the situation prior to the catastrophe (restoration, reconstruction, stabilization, rehabilitation, etc.). Given the vastness of the topic, the research has given priority to "risk prevention", identifying several examples of risk assessment and mitigation measures.

The fourth chapter: “Case Studies”, presents the cases studies themselves. The choice of case studies was a reasoned choice, not based on statistical criteria. About a dozen case studies, in various regions of the world, were chosen, to represent a range of direct and secondary disasters such as earthquakes, fires, floods, wide scale pest infestations etc. These are presented, described and analysed, in each aspect regarding the key concepts identified in this theory. The case studies gave me the chance to investigate sectors outside my specialisation. Scientific exchange with fellow architects, sociologists, biologists, botanists, conservators, engineers, firefighters, physicians etc, have enriched the contents.

The research is also accompanied by a series of annexes, most of which I have developed personally. There are also forms for the identification and analysis of risk management of cultural property, as well as a bibliography, web references, lists of conferences and courses relevant to the thesis, papers and international recommendations, etc.

CHAPTER II

PREVENTIVE CONSERVATION VERSUS DISASTER RISK MANAGEMENT

II.1. INTRODUCTION

Preventive conservation is now a recognised discipline in Italy, and has been the theme of University courses and conventions in recent years. Despite this, the professional profile and the specific roles that preventive conservation professionals may play, have yet to be clearly defined. Likewise, the real savings of preventive action, as opposed to classical restoration, have still not been specified and highlighted. There are many work opportunities in the field of preventive conservation, especially in our country where economic resources for cultural heritage protection are often inadequate.

One should not undervalue the importance of defining, with maximum precision, the terms used in the field of restoration and conservation. Concepts that can apparently by classified intuitively into mental categories reveal, however, their complexity, when one tries to elaborate a precise definition for them and to limit free interpretation. In Italy, the problem is highlighted by Article 29 of the current Code of Cultural and Natural Heritage (legislative decree no 42 of 2004)[1] which stipulates that:

> "1. The conservation of cultural heritage is assured by means of a coherent, co-ordinated and programmed activity of study, prevention, maintenance and restoration.
>
> 2. By prevention, one intends the combination of suitable activities to limit the situation of risk connected to the cultural heritage in its context.
>
> 3. By maintenance, one intends the combination of activities and interventions intended to monitor the upkeep of the cultural heritage, and to maintain its integrity, its functional efficiency, its identity and its separate parts.
>
> 4. By restoration, one intends direct intervention on the heritage, through a combination of operations aimed at its material integrity and the recuperation of the heritage itself, and the protection and transmission of its cultural values. In the case

[1] The definitions have remained the same in the latest changes to the Code (legislative decree no 62 of 24 March 2008).

of property located in zones declared at risk of earthquakes, according to current regulations, restoration includes the intervention of structural improvement.[2]"

In this case, ambiguity arises from the conceptual overlap between "maintenance" and "prevention" (because maintenance is in itself a form of prevention) which is not made clear in the text. There is also confusion regarding "prevention" and "restoration" (which, according to these definitions, are both concerned with limiting risks to the property), and uncertainty about the precise meaning of "integrity" (maintenance) as opposed to "material integrity" (restoration). Lastly, there is ambiguity regarding "context" (prevention) and "condition" (maintenance). Furthermore, although according to these first subsections conservation includes prevention as well as maintenance and restoration, in subsection 11 of the same article the expression "interventions of conservation and restoration on cultural heritage" is used, as if, in this case restoration was distinct from conservation, when in fact, according to the first subsection, it is one of the activities of conservation. It must be noted that the definitions in a legal text have the function of narrowing the interpretation of the jurist rather than widening it; hence they need to be precise. A problem that at first sight may seem banal, therefore, can have very real consequences in the moment of application, in this case of a law (Lambert 2008) .

The problem of dividing the activities into various fields remains: "restoration" as opposed to "conservation", but also "preventive conservation" as opposed to "curative conservation", a classification used nowadays mainly by French-speakers, which apparently originated from English in the early 1900's (Waller 2003), which has the merit of being extremely clear. While the distinction between preventive conservation, curative conservation and restoration can be easily clarified using the same analogies from the world of medicine, one might ask oneself, more precisely, about the nature of the actions, motivations and objectives that these imply. Gaël de Guichen (2007), noting a proliferation of terms in the sector, and an ever growing confusion between them, suggested regrouping the various actions of the diverse types of activity regarding cultural heritage into three large categories, omitting, out of provocation, assigning them a term, so as to urge for international co-operation so as to arrive at a unanimous opinion on the subject. The underlying idea was founded on the premise that although the terms have often changed and multiplied through the years, the actions they imply have remained the same. Simon Lambert in his thesis [3], completed de Guichen's work,

[2] As my translation.
[3] Lambert, Simon. *Storia della conservazione preventiva-La formazione di una coscienza collettiva*. Università

reorganising the data and formulating three definitions regrouped under the terms "restoration", "curative conservation" and "preventive conservation". These terms are intentionally schematic, so as to facilitate the elimination of any superimposition; they should be examined comparing one to the other so as to be able to distinguish, for example, how restoration is distinct from curative conservation, and how curative conservation is distinct from preventive conservation.

Restoration: An action intended to reinstate the readability, function of use, and aesthetic or historic appearance of an object that is degraded but still in stable condition, which no longer transmits its principle message due to having suffered past aggression. The intervention, of low priority, is carried out by a restorer[4] on a single object and the result is always traceable on the object. It can include several of the following actions: touching up, reattachment, reintegration, repainting, etc.

Curative conservation: A direct or indirect action intended to stop present aggression on a deteriorating object and return it to a stable state. The intervention, of high priority, is carried out by a specialised restorer/technician on a single object or on a group of objects and the result is rarely visible. It can include the following actions: disinfestation, deacidification, desalinisation, disinfection, consolidation, etc.

Preventive conservation: An indirect action intended to stop, block, reduce or control future aggression that threatens an object of any age, or in any state of conservation. The intervention, of essential nature, is carried out in the environment surrounding a group of objects by various professionals and the public; the result is almost always invisible. It can include the following actions: humidification, ventilation, installation, organisation of the storerooms, involvement of the public, etc. (de Guichen 2007, 71-72).

So, at first sight, the three sectors can be distinguished from one another by the time (i.e. past, present or future) of the aggression to which they are subjected, by the level of priority of the intervention, by the direct or indirect nature of the intervention, by its all-round nature or

degli Studi di Urbino "Carlo Bo", Facoltà di Lettere e Filosofia, Urbino, 2008.

[4] The term used by de Guichen was "conservator-restorer," but it has not been used here so as to avoid confusion between Anglo-Saxon and Latin interpretations, as texts in several different languages have been quoted in this work.

otherwise, by its visibility and by the professionals involved. Above all, the three sectors can be distinguished by the precise "actions" that they entail. To simplify, it can be said that conservation groups together all the direct and indirect actions that help increase the life expectancy of both healthy and deteriorated collections, and that it can be divided into "curative conservation" and "preventive conservation". "Restoration", on the other hand, corresponds to direct actions whose main aim is to give back an aesthetic message (de Guichen 1999, 4).

Restoration: Timely aesthetic intervention to recover a message lost due to past aggression

Conservation: To increase the life expectancy of a collection and/or of an object (healthy or degraded)

- **Curative conservation:** To return to a stable condition having halted a present aggression
- **Preventive conservation**: To avoid, block, reduce or control future aggression

The first objection to such a three-part classification, as Denis Guillemard (1992) pointed out, is that the division between "curative" and "preventive" is not always clear. Those who work in the field of cultural heritage conservation (or restoration) know very well that some operations, such as the strengthening of plaster that is in danger of crumbling (which in the above classification would be considered curative conservation), could effectively also block, avoid or control future aggression (preventive conservation).

This implies that the distinction should instead be sought in the methods. In other words, to see where curative conservation ends and where preventive conservation begins, it is not necessary to see what one wants to obtain through the activity being carried out (objectives), neither what that activity achieves as a result (effects), as very often these two overlap. On the contrary, it is necessary to understand the way in which the activity takes place (methods). An idea about these methods can be found in the classification suggested by de Guichen (2007), i.e. humidification, ventilation, installation, organisation of storerooms, involvement of public, etc.

However, the matter becomes even more complicated, as one has claimed that preventive conservation is not made up of specific treatments, but that it is in fact a conceptual approach to conservation (Caple 1994) or that it implies a "change in mentality" (de Guichen 1995). But this does not change the fact that in practice, preventive conservation is carried out through a

series of procedures, i.e. with very precise methods. One supposes therefore that preventive conservation sits on two opposed but complimentary planes: one more concrete, made up of interventions or specific actions, and the other more abstract. Consequently, we need a definition that takes into account the technical aspects but also goes beyond them, considering objectives, methods and effects in a more abstract manner and justifying them in a social context, while also establishing the importance of interdisciplinary collaboration between the individuals in preventive conservation, be they professionals or otherwise.

Through the course of history, the more generic “preventive measures” and “prevention” of “preventive conservation” have been distinguished through the criteria of co-ordination, orderliness, strategy and interdisciplinary nature. These criteria could also act hypothetically as “indicators” of the level of thought reached on the all-round nature, prevention and the necessity of indirect intervention on the cultural heritage for a determined epoch or specific initiative. Intuitively, both the execution, on one hand, of a preventive conservation programme for a group of countries, and the carefulness, on the other hand, of covering the prints exhibited in a historic house with fabrics, seem to derive from the same distant origin. Denis Guillemard (1992, 16) described this as such, “from their origins, the concepts of preventive conservation have been built upon necessity.” Nonetheless, something distinguishes the two examples in their level of organisation and planning, that is, in their coordination, systematisation, strategic planning and interdisciplinary nature. In a way, the first example of the project implemented in several countries at the same time is the result of the sum in time of several initiatives similar to the second example (single isolated actions). Therefore, similar to the second example, but perfected with time, tested scientifically, inspired by other sectors which society has accepted as necessary, so that a collective conscience (awareness) has been created.

Recently, many people have become interested in the historic aspects of specific sectors of preventive conservation, concentrating, for example, on the recommendations for relative humidity (Antomarchi and de Guichen 1987, Michalski 1993, …). This aroused interest in investigating more extensively, at a global level, the progressive development of the discipline of preventive conservation. Through the course of history, rather than intervene on a single object, it has been found preferable to intervene indirectly on the context, the environment, or at least on the causes of the deterioration, instead of limiting oneself to its effects. Various historic reasons and events have speeded up or slowed down the international expansion of this discipline.

ICOM in its Code of Ethics and through its International Committee for Conservation (ICOM-CC) has considered the preventive conservation issue and tried to determine its definition, use and competences.

In the first ICOM Code of Ethics for Museums, Chapter 6, Paragraph 3, in 1986, the importance and the need for preventive conservation was recognised:

> "[...] Special attention should be paid to the growing body of knowledge about preventative conservation methods and techniques, including the provision of suitable environmental protection against the known natural or artificial causes of deterioration of museum specimens and works of art."

ICOM's Code underwent various revisions during the last years. In its last version of 2006, in Chapter 2 "Museums that maintain collections hold them in trust for the benefit of society and its development", Paragraph "Care of Collection" we find the following descriptions:

> *"2.21 Protection Against Disasters*
> Careful attention should be given to the development of policies to protect the collections during armed conflict and other human-made or natural disasters.
>
> *2.22 Security of Collection and Associated Data*
> The museum should exercise control to avoid disclosing sensitive personal or related information and other confidential matters when collection data is made available to the public.
>
> *2.23 Preventive Conservation*
> Preventive conservation is an important element of museum policy and collections care. It is an essential responsibility of members of the museum profession to create and maintain a protective environment for the collections in their care, whether in store, on display, or in transit.
>
> *2.24 Collection Conservation and Restoration*
> The museum should carefully monitor the condition of collections to determine when an object or specimen may require conservation-restoration work and the

services of a qualified conservator-restorer. The principal goal should be the stabilisation of the object or specimen. All conservation procedures should be documented and as reversible as possible, and all alterations should be clearly distinguishable from the original object or specimen."

A Resolution was adopted by the ICOM-CC membership at the 15th Triennial Conference in New Delhi, India on 22-26 September 2008 about the terminology to characterise the conservation of tangible cultural heritage. ICOM-CC adopted the following terms: "preventive conservation", "remedial conservation", and "restoration" which together constitute "conservation" of the tangible cultural heritage. These terms are distinguished according to the aims of the measures and actions they encompass. The definitions of the terms are as follows:

"**Conservation -** all measures and actions aimed at safeguarding tangible cultural heritage while ensuring its accessibility to present and future generations. Conservation embraces preventive conservation, remedial conservation and restoration. All measures and actions should respect the significance and the physical properties of the cultural heritage item.

Preventive conservation - all measures and actions aimed at avoiding and minimizing future deterioration or loss. They are carried out within the context or on the surroundings of an item, but more often a group of items, whatever their age and condition. These measures and actions are indirect – they do not interfere with the materials and structures of the items. They do not modify their appearance.

Examples of preventive conservation are appropriate measures and actions for registration, storage, handling, packing and transportation, security, environmental management (light, humidity, pollution and pest control), emergency planning, education of staff, public awareness, legal compliance.

Remedial conservation - all actions directly applied to an item or a group of items aimed at arresting current damaging processes or reinforcing their structure. These actions are only carried out when the items are in such a fragile condition or deteriorating at such a rate, that they could be lost in a relatively short time. These actions sometimes modify the appearance of the items.

Examples of remedial conservation are disinfestation of textiles, desalination of ceramics, de-acidification of paper, dehydration of wet archaeological materials, stabilization of corroded metals,

consolidation of mural paintings, removing weeds from mosaics.

Restoration – all actions directly applied to a single and stable item aimed at facilitatingits appreciation, understanding and use. These actions are only carried out when the item has lost part of its significance or function through past alteration or deterioration. They are based on respect for the original material. Most often such actions modify the appearance of the item.

Examples of restoration are retouching a painting, reassembling a broken sculpture, reshaping a basket, filling losses on a glass vessel."

Conservation measures and actions can sometimes serve more than one aim. For instance varnish removal can be both restoration and remedial conservation. The application of protective coatings can be both restoration and preventive conservation. Reburial of mosaics can be both preventive and remedial conservation. Conservation is complex and demands the collaboration of relevant qualified professionals. In particular, any project involving direct actions on the cultural heritage requires a conservator- restorer (ref. ICOM-CC definition of the profession, Copenhagen, 1984, and ICOM code of ethics).

II.2. HISTORIC REFERENCES AND ORIGINS

As early as 1956, Cesare Brandi was discussing "preventive restoration" in an article published in the *Istituto Centrale del Restauro* (Central Institute for Restoration) newsletter, then again in 1963 in the *Teoria del restauro* (Theory of Restoration). Restoration was defined as "a methodological moment in the recognition of a work of art for its twofold polarity, both aesthetic and historic". On the other hand, preventive restoration is "the protection, the removal of danger, the assurance of favourable conditions". This definition was already close to a modern concept of conservation interventions. The concept of restoration was updated, integrating the modern notion of conservation. Nevertheless, Brandi continued to use the term restoration.

In 1964, at the "*Congresso internazionale degli architetti e dei tecnici di monumenti*" (International Congress of Architects and Technicians of Historic Monuments) the Venice Charter[5] was drafted, in which concepts appear such as systematic maintenance, the conservation of the surrounding area, the importance of not separating the monument from its environment, and the importance of not separating various parts of a monument, as well as the idea that restoration must be of exceptional quality.

In the 1970's, Gaël de Guichen (de Guichen 1978) of ICCROM and Gary Thomson (Thomson 1970, 1971, 1978) began delineating the first definition of preventive conservation, on an international level, identifying it as the discipline that encompasses all the interventions that must be embarked upon to improve the state of conservation of an entire collection, a monument or an archaeological site. Above all, they brought into consideration the interaction with the surrounding environment.

In 1987, the Charter of the *Consiglio Nazionale delle Ricerche (CNR)* – (National Council for Research) on conservation and restoration of works of art and culture, presented conservation as the totality of acts of prevention and safeguard aimed at assuring an unlimited duration of the material form of the object concerned. Prevention is defined as the totality of acts of conservation, motivated by long-term predictive knowledge of the object in question, and on the conditions of its environmental context. Restoration is identified as any intervention that,

[5] http://www.international.icomos.org/publications/homme.htm

with respect for the principles of conservation, and on the basis of previous cognitive investigations, is aimed at giving back to the object, within possible limits, its relative readability and, where possible, its use. In contrast, maintenance is the totality of acts applied repeatedly to keep the cultural heritage in an optimal condition of integrity and operation (functionality), especially after having undergone extreme conservation and/or restoration interventions.

In English-speaking countries, the term conservation assumes a more general meaning, in that it includes all the interventions carried out on an object and on its surrounding environment: from research into the original materials it is composed of, to interventions of consolidation, and to activities that regard more exactly preventive conservation. In contrast, the term restoration is used to designate the operations closely connected to increasing the value of the object. These interventions constitute a particular moment, and above all an optional moment, of conservation in its totality.

In the 1980's, various English-language institutions, including the Canadian Conservation Institute, which made the first move, adopted this new approach, using it in everyday activities aimed at improving the state of cultural heritage conservation. Preventive conservation is considered as the control of the place and the environment where the objects or monuments are found, so as to reduce the harmful consequences caused by bad lighting, high pollution levels, or by abrupt variations in temperature and relative humidity.

In the early 1990's, particularly in English-speaking countries, the binomial "restoration-conservation" was introduced to indicate the globalism and the modernity of the concept. It implied, above all, the desire to assure the permanence and integrity of the cultural heritage, allowing it to be studied and preserved, while also to recognise the objects' social value, realised through the revelation and development of their aesthetic and historic messages, and the restrictions imposed by conservation.

In 1993, the general assembly of European Confederation of Conservator-Restorers' Organisations (ECCO) identified preventive conservation with indirect actions on cultural heritage, intended to slow down its deterioration and prevent risks of change by creating optimal conditions of preservation compatible with its social use. Preventive conservation therefore also regards the handling, utilization, transport, conditioning, storage and exhibiting

of the cultural heritage.

A European Summit took place in Pavia in autumn 1997, and was attended by the leading European experts from the fields of restoration and conservation. The resulting paper, the Document of Pavia, recommends that conservation and restoration are recognised and promoted as separate disciplines in their own right.

In 2000 at Vantaa in Finland, specialists in preventive conservation from almost all the countries in Europe met to outline a common European strategy – "the European Preventive Conservation Strategy". On this occasion guidelines were defined to help the various countries to develop political, educational and work experience strategies regarding preventive conservation on a national level

Preventive conservation became a term shared on an international level. Besides educational courses, conferences focusing specifically on preventive conservation began taking place. This encouraged countries around the world to start exchanging information about research and education.

In 1992, in Paris, the first international talk on preventive conservation took place, organised by the Association des Restaurateurs d'Art et d'Archéologie de Formation Universitaire (ARAAFU). Two years later, in September 1994, the International Institute for Conservation of Historic and Artistic Works (IIC) organised a conference called "Preventive Conservation – Practice, Theory and Research" in Ottawa.

In 1999, during the celebration of "Restauro '99" (the VII show of the art of restoration and the conservation of cultural and natural heritage), the *Istituto dei Beni Artistici, Culturali e Naturali (IBC), (*Institute of Artistic, Cultural and Natural Heritage), as it was called then, of Emilia Romagna in Italy, organised the international conference "New services and Professionalism for Protection – The Preventive Conservation of Museum Collections". That was the first time that the benefits of preventive conservation were discussed in Italy. Together with their Italian colleagues, preventive conservation experts from abroad took part in the debate, still not all convinced about the role this new discipline would play in our "ancient" country.

II.3. EDUCATIONAL EXPERIENCE

L'ICCROM (already in 1975), the Museums and Galleries Commission (MGC) in London and the Getty Conservation Institute (GCI) in California (from the late-1980's) offered training courses and/or specialisations in preventive conservation for those working in cultural heritage, including conservators, restorers, architects, biologists, archaeologists, geologists etc. This encouraged contact between the various professions, highlighting the need to work in multidisciplinary groups with participants taking on varied levels of responsibility. Through these training courses, preparing professionals specifically for the field of preventive conservation, the discipline's overlapping characteristics began to define themselves more clearly.

Since the early-1990's, the University of Paris I Panthéon-Sorbonne has offered a Masters Advanced Studies course in Preventive Conservation (Diplôme d'études supérieures spécialisées- DESS - en Conservation Prèventive) which until 2008 was the only university course at master level in this subject. In 2009 a Master Course in Preventive Conservation is offered at the University of Belgrado, in Serbia in collaboration with the Diana Centre for Conservation. As of 2002, University College London offers a degree and masters in Sustainable Heritage Management in which preventive conservation plays a fundamental role - the economic advantages of preventive conservation are also emphasised here.

At present abroad, preventive conservation is included in almost all the cultural heritage conservation curriculums. In Italy, preventive conservation is only taught sporadically and only at Masters level, as for example in the European Masters in Cultural Heritage Management and Conservation at the University of Cassino.

In some Italian universities, degree courses in science and technology for cultural monuments mention preventive conservation among specific skills that students will acquire.

In 2004, the University of Perugia offered a Masters course in Preventive Conservation of Cultural Heritage. The course is organised by the Region of Umbria and financed by the European Social Fund.

All professions involved have the common objective of minimising the risk of damage to collections, monuments, archaeological sites, archives and libraries. A good preventive conservation programme requires the experience and co-operation of all the professions connected to cultural heritage, and requires that the notion of conservation-preservation of the heritage is taken into account in all the decisions made by the institutes responsible for it.

II.4. AN EXAMPLE OF PREVENTIVE CONSERVATION MANAGEMENT

"Teamwork for Preventive Conservation", an ICCROM project initiated in 1995, is an excellent example of preventive conservation management. The principle objective of this project is the creation of a multi-disciplinary group of professionals, within a museum, with the task of mobilising preventive conservation and identifying a plan of action and the resources available to make it work in a time frame of 1-3 years.

ICCROM's Preventive Conservation Indicators[6] are an instrument of self-evaluation for monitoring the state of preventive conservation in a museum. This is an instrument to promote the exchange of specialised knowledge and debate between the various professions within a museum, and a way of planning and managing the activities of preventive conservation.

II.5. STANDARDS AND METHODS

An efficient preventive conservation intervention can be achieved by pursuing the following phases:

- inspection of places and of objects contained within them;
- forecast for the means of moving works, and of staff conduct;
- data collection: documents, schemes, plans, bibliographies, specific earlier research, photographs... ;
- data analysis and synthesis;
- identification of the causes of any damage noticed and of the actual and likely risks;
- processing of preventive conservation intervention schedule, highlighting priority according to time and cost (brief, medium and long term, and low, medium and high cost);

[6] See Annex II.b.

- execution of interventions;
- control, valuation and verification of effectiveness and usefulness of interventions;
- eventual modification of strategies adopted;
- diffusion of results obtained.

As well as its own methodology, preventive conservation uses specific standards, the principle ones being those of ICCROM, ICOM, IIC, MGC and the Canadian Conservation Institute (CCI). Besides these, recognised at an international level, we can add many others developed at a local level by museum associations or institutions concerned with cultural heritage protection.

For example: regarding illumination, the MGC's standards for the conservation of archaeological collections consider 300 lux to be the maximum level of illumination for inorganic materials (metals, stone, ceramics, enamels etc.), and 50 lux the minimum for textiles and paper materials. Materials soaked in untreated water should be conserved in complete darkness. The maximum acceptable level of ultra-violet radiation is 75 μW/lumen. Regarding the control of air pollution in the places where archaeological finds are exhibited or stored, the MGC's standards require a level of filtration of 90% to eliminate larger particles (> 1μm) and of 50% for smaller ones (<1μm). In urban areas, it is also necessary to filter the air with activated carbon to reduce pollutant gases.

The application of thermohygrometric standards on personal property is more complex, as one needs to consider the individual history of each case. In the specific case of archaeological finds, one needs to verify the relative humidity and the temperature of the soil from which they were removed at the moment of excavation, and to try to keep them on those conditions, then gradually acclimatise them to the hygrothermal conditions of the new environment in which they will be conserved. In addition, one needs to remember that international standards are applicable only in certain climatic zones, hence the importance of having specific hygrothermal standards for each country and/or region. In this case, common sense and flexibility play a very important role. To conserve adequately the Ancient Egyptian finds that are now in the Museum of Egyptian Antiquities in Cairo, the Egyptian Museum in Turin, the Louvre and the British Museum, the same hygrothermal standards were not applied, because the objects, even though they came from the same place of origin, had to adapt to diverse local conditions. If, for example, an object from the Louvre has to be lent for

an exhibition in Cairo, and must therefore travel, those concerned should ensure that both while in transit and while on exhibit, it is kept in the same temperature and relative humidity levels that it was used to in Paris. Still considering the standards put forward by the MGC, we can summarise that for metals, inorganic and organic materials, the recommended temperature oscillates between a minimum of 10°C and a maximum of 25°C, while materials soaked in water should not be exposed to temperatures exceeding 10°C. In general, temperatures should be very low, without however arriving at freezing, as the lower the temperature the slower the process of deterioration of the materials. This standard is easily applicable in the case of finds conserved in deposits. However, for objects on display to the public, a compromise needs to be found, taking into consideration the thermal comfort of human beings, even if this, from the point of view of prevention, is not the main priority.

The relative humidity value proposed for metals (making up part of a composite collection), inorganic and organic materials should not exceed 50%. 35% is recommended for collections of only metal, a value of under 35% in the case of microclimates created for non-ferrous metals, and less than 15% for ferrous metals. For materials soaked in water, it is recommended that a microclimate with relative humidity equal to 100% is prepared in advance.

In addition, more generic standards exist for building conservation, training and other common themes including preventive conservation. It is important that the standards are used and adapted to the specific needs of the objects only by specialists, so as to avoid possible errors that could permanently damage collections.

II.6. DETERIORATION FACTORS

Alterations in the state of conservation of objects can be caused by: environmental factors (humidity, temperature, light, atmospheric pollution), infestations (microorganisms such as mould and bacteria, and insects), the interaction between the building that contains them and the materials they have contact with, poor functioning of security and anti-fire systems (often due to lack of upkeep) and the actions of human beings.

In addition to these causes, often we can add the lack of inventory and documentation. If each conserved object is not catalogued with one or more dated photographs (useful for retrieval of the work in the case of theft, and for recording its state of conservation and the changes it

undergoes with time), historical background (place of origin, participation in previous collections), iconographic and stylistic information (regarding the techniques and the materials it is made of), and if there are no documented references to earlier restoration interventions, one cannot plan a complete programme of preventive conservation.

A documented inventory of the objects being conserved lies at the root of the process of preventive conservation. Without it, many operations could prove useless and at times fatal.

II.6.A. Environmental factors

II.6.A.a. Relative Humidity and Temperature

In the specific case of the conservation of the goods of museum companies, we need to consider the microclimates of closed and clearly defined spaces, such as the halls of a museum or the storerooms, the cupboards, shelves and showcases. The two main elements that characterise climate are humidity and temperature. In closed spaces of limited dimensions, temperature variations are not very high, in general oscillating between a minimum of 5°C and a maximum of 30°C. Few objects are sensitive to these temperature alterations. However, if we consider variations in humidity, objects can react with more sensitivity. The temperature will therefore be taken into account as a factor that influences variations in air humidity.

Water, in the form of vapour, is always present in the air and represents a potential danger to the conservation of objects, if their potential behaviour is not known. A volume of air, at a given temperature, contains a certain quantity of water vapour, more precisely known as absolute humidity (from here onwards referred to as A.H.). This quantity of vapour cannot rise above a certain limit. The threshold that A.H. can reach is called the saturation limit.

The hotter the air is, the more humidity it can contain: at 10°C one cubic metre of air can contain a maximum of 10 grams of vapour, while at 20°C it can contain 18 grams. At these levels the air is saturated, meaning that it can not contain any more water in the form of vapour. In the moment in which the temperature drops, the cooled air cannot contain the same quantity of water vapour, and it therefore condenses in the form of small droplets (the phenomenon of condensation: the transition of a substance from a gas to a liquid state). The

more the air cools, the more the quantity of water (condensed vapour) contained within the same space rises.

We can note, therefore, a close relationship between the quantity of water vapour contained in the air (the A.H.) and the temperature. The relationship between these two elements is called the relative humidity (from here onwards referred to as R.H.), which is defined as "the measure of the saturation of the air humidity as a percentage" and is expressed by the following formula:

$$\text{R.H.} = \frac{\text{Quantity of water vapour contained in a given volume of air}}{\text{Maximum quantity of vapour admissible in this volume, at the same temperature}} \times 100$$

or better:

$$\text{R.H.} = \frac{\text{Absolute existing humidity (A.H.)}}{\text{Maximum possible (saturation)}} \times 100$$

A volume of 1 cubic metre at 50% of R.H., at any temperature, contains half the humidity that it could contain in total. We can note, therefore, that at an elevated temperature, air containing 10 grams of water vapour will have drying effect, while the same volume, at a very low temperature, will be close to saturation. We can deduce from this that in a closed and sealed volume of air:

- if the temperature rises, the relative humidity falls;
- if the temperature falls, the relative humidity rises.

Even in a single day, we can experience notable variations (from $\pm$ 10-20%) in R.H., which can create serious problems, above all for hygroscopic materials. The lack, the decrease or the increase in humidity causes distinct alterations depending on the type and history of the component materials of the object concerned.

Standards exist that take into account various types of material, the earth's climatic zones and their seasons, and that above all recommend avoiding abrupt and rapid variations in temperature and relative humidity. They also recommend a knowledge of the history of the objects so as to be able to keep them in a balanced state. In any case, one has to be able to control the air that the objects are in contact with. Whenever we note a rise in the temperature, we should add water vapour, while corresponding to any drop in temperature, we should subtract it. Before deciding on the correct temperature and relative humidity levels for exhibiting, storing, packing or transporting objects, we need to undertake an all-round study that takes into account their nature, type, place of origin, previous restoration interventions and the history of all the movements they have been subjected to. After this, we can adapt the values proposed by the standards.

Every object has its own identity and personal history, and it is important to remember this. If, for example, the head of a bronze Roman statue is found in the sea decades or centuries after the exhumation of the rest of the body from an excavation, we should consider the two parts as two separate objects before putting them back together. This way we can create a new climatic equilibrium that satisfies the needs of both parts.

II.6.A.a.1. Monitoring

To understand the hygrometric values of a space, whatever it is, we need to be able to measure it using various instruments. A thermo-hygrograph is used to measure both temperature and R.H., while the hygrograph measures just the R.H (Fig.3.).

Fig.3. A team of museum professionals at the Museu Nacional de Arte de Catalunya, Barcelona, surrounding a thermo-hygrograph. (© C.Menegazzi)

The values must be recorded continually for at least six months to allow a reading of the variations and anomalies, and to try to understand the causes. The most common appliances are fitted with a cylinder, that rotates around itself at a daily, weekly or monthly rhythm, and upon which is registered the temperature and R.H. (or just the R.H. in the case of the hygrograph) on a role of paper. When the danger of hygrothermal variations is less likely, it is more common to use weekly registration sheets. Daily registration is used instead for more detailed studies, for example in the case of testing a new air-conditioning system, or if frequent variations have been detected, etc. Monthly registration sheets are recommended for keeping a measure of control after having taken weekly registrations for at least one year with

no severe variations (› ± 10%).

The humidity sensor is made up of fibres (generally hair) that contract when the R.H. drops and expand when it rises, and thereby causes the movement of an ink-soaked point mounted on an arm that is connected to the cylinder. The temperature, on the other hand, is collected by metallic sensors that react and transmit the variations to the cylinder by the same process. To obtain reliable values, that reach a precision of ± 2%, the thermo-hygrograph must be calibrated once a month. This instrument is placed in the exhibition rooms, showcases, storerooms, restoration workshops and outdoor spaces (sheltered from the rain and strong winds), to allow a comparison between the internal and external thermo hygrometric variations.

Hygrometers are smaller instruments that function along the same principles, using the sensibility of hair to humidity (Fig.4.).

Fig.4. Hygrometer in a showcase of the Collezione Alberoni, Piacenza. (© C.Menegazzi)

The fibres (or hairs) are attached to a needle that indicates the R.H. level on a dial. Precisely because of their dimensions, hygrometers are often used to measure hygrometric values in small spaces, such as showcases, small containers, drawers and cupboards. Hygrometers have a precision of ± 5% and must be calibrated at least every two weeks.

It exists also digital thermo-hygrometers. They are normally used for punctual measurements in open spaces (Fig.5.).

Fig.5. Digital thermo-hygrometer in use. (© C.Menegazzi)

In contrast, the psychrometre serves to calibrate the aforementioned instruments. It is made up of two thermometers fixed to a support. One of these has a bulb clad in a thin layer of cloth that is immersed in distilled water. Manually (a manual psychrometre) or electrically (an electric psychrometre) it is operated by the air that comes into contact with the bulbs of the two thermometers. If the air is not saturated with humidity, the wet thermometer, thanks to the evaporation, indicates a lower temperature than the dry one. From the difference in temperature between the two thermometers, one can calculate the level of humidity by means of a psychrometric chart. It marks the temperature of the dry thermometer on the abscissae

(horizontal axis), and from here rises a perpendicular that meets the line of the temperature of the wet thermometer; the relative humidity is represented by the curve that passes through this point.

Nowadays, and when financially possible, temperature and R.H. can also be measured through probes positioned in the exhibition rooms, storerooms, showcases and restoration workshops. These are then connected to a central computer, whose software registers data to provide charts with temperature and R.H. levels, and sketches a curve illustrating the thermo-hygrometric trends relative to each observation point. These extremely useful instruments must however be used with awareness.

II.6.A.a.2. Control

If R.H. values are too high or too low, in exhibition spaces or in storerooms, appliances that absorb or emit water vapour can be used. A dehumidifier absorbs excess vapour and reduces R.H., while a humidifier gives off water vapour and increases R.H. Therefore, R.H. can be controlled and stabilised at the desired level, required by the space and the collection concerned.

For microclimates, such as showcases and containers of various types, silica gel can be used. This substance, which is chemically inert, non-toxic and non-corrosive, is used as a non-mechanical means of absorbing or emitting humidity, or maintaining R.H. at a stable level in a small closed space. Some types of silica gel granules contain a substance that makes them change colour, from blue to pink when the gel is saturated, and from pink to blue when it is dried out in an oven for reuse. The silica gel is available both in granules (to put in containers or gauze sachettes) and in strips, and should be located in a closed space, not in direct contact with the objects. This way, severe variations in R.H. can be controlled, by calibrating the silica gel at the R.H. levels required (Thomson 1967, 1978).

Whenever the financial means don’t permit the use of silica gel, other materials that absorb and emit humidity into the air, such as cotton, wood and paper, can be used in the same way, but with slower and less effective results.

II.6.A.b. Light

If well monitored and controlled, light radiation is not particularly damaging to collections of objects made up of organic materials, such as textiles, paper etc. Likewise, inorganic materials, such as stone and metal, are almost completely insensitive to waves from the visible light spectrum, though if coated with paint or in a state of advanced deterioration (ancient glass, corroded metals etc), their decline can be accelerated by exposure to light.

Light radiation, or the 'visible region', is only one part of the electromagnetic spectrum, which is composed of various types of radiation that range from radio waves (the longest) to gamma rays (the shortest). The shorter the wavelength, the greater its capacity to destroy. The electromagnetic spectrum is subdivided into:

- radio waves;
- radar waves;
- infra-red waves (heat);
- visible radiation (light);
- ultra-violet waves;
- x-rays;
- gamma rays.

The sources of light radiation are divided into:

- natural light;
- artificial light:
    - incandescent;
    - fluorescent.

Objects lit by the sun, by incandescent or fluorescent lamps, are subjected to ultra-violet, infra-red and light (visible) radiation, all at the same time. Incandescent lamps emit visible radiation, a large quantity of infra-red radiation (heat) and little ultra-violet radiation. Fluorescent lamps emit light (visible) radiation, a low quantity of infra-red radiation and a variable level (though higher than incandescent lamps) of ultra-violet radiation, depending on the type of tube used.

II.6.A.b.1. Monitoring Light Radiation

Before reducing the radiation that strikes objects, we need to be able to measure it. The measurement of light intensity, expressed in lux (lx), is carried out with a lux meter (Figs.6. and 7.).

Figs.6. and 7. Lux meter in use. The photosensitive cell of the lux meter has to be positioned perpendicular to the rays of light. (© C.Menegazzi)

The quantity of ultra-violet radiation is expressed in microwatt per lumen and is measured by a radio meter or UV Monitor (Fig.8.).

Fig.8. Radio Meter or UV Monitor. (© C.Menegazzi)

Infra-red radiation, emitting heat, can be measured by placing a thermometer close to the object in question to reveal its temperature.

II.6.A.b.2. Control of Light Radiation

For the protection of the collection, preventive conservation considers the following fundamental principles:

- elimination of ultra-violet radiation;
- reduction of infra-red radiation;
- reduction of light intensity;
- reduction of time exposed.

The maximum limit of ultra-violet radiation allowed is 75 μW/Lumen. To reduce or eliminate it, anti-UV filters (ultra-violet light absorbers) can be used, applied directly in front of the source of the emission (lamps, windows). Alternatively, one can choose special tubes with low UV emission, and reflect the light on white walls treated with paint that absorbs ultra-violet radiation.

Infra-red radiation can be reduced using a special lamps (cool beam), which emit infra-red radiation in the opposite direction (behind themselves) to the light beam, or by applying a reflective coating to spotlights. It is also necessary to avoid placing incandescent light sources inside showcases, as they heat up and dry out the air. The recommended light intensity for objects of medium sensibility is 250 lux, and for those of extreme sensibility, 50 lux. Filters that reduce light intensity are placed over the emission sources (lights, windows) to reach these recommended levels, though the position and the distance of the object from the light source must be chosen accurately.

A reduction in display time can be achieved in various ways; for example, alternating objects on display with those in storerooms, turning off lights in the absence of visitors, and/or not lending the objects for temporary exhibitions for more than 3 consecutive months. There is a relationship between the intensity of light and the duration of display. It is possible to reduce the damage to works caused by light, by the constant control of these two factors. For example, a very sensitive object displayed at 500 lux for 10 hours per day for one year (365 days) will be exposed to a total of 1.825.000 lux. As in all other areas of conservation, one can multiply the life of the light-sensitive object by ten years, if it is exposed to 50 lux for 10 hours per day, and by 100 years if it is lit for only one hour per day (Ezrati 2004).

II.6.A.c. Environmental Pollution

When high levels of atmospheric pollution are found in the proximity of museums housing sensitive works, it is necessary to intervene, by creating microclimates with controlled atmospheres. In places where the air is treated, filtration can be used to reduce the quantity of dust, pollution and germs of various origins.

Methods used for measuring the efficiency of filters are:

1. the gravimetric or weight method, carried out with an atmospheric aerosol, applicable to filters of medium efficiency;
2. the opacimetric method, also carried out with an atmospheric aerosol, applicable to filters of high efficiency.

The choice of filtration systems is determined by the nature of the particles suspended in the air. Decent protection of the conserved objects can be assured by filters of opacimetric efficiency equal to 70%, which will eliminate all the spores and most of the particles that could soil or discolour the objects. But only when the opacimetric efficiency reaches 98% is the protection considered optimum. In this case, the filtered air will not contain bacteria, radioactive dust, or any type of smoke or harmful particles. The quality of a filter depends on the way it is installed, on the filtering materials and on the materials that seal the device to its surroundings. To conserve works that are located in highly polluted areas (urban or industrial zones) properly, dangerous products need to be eliminated by absorption. Activated carbon is the best material for this, as the harmful molecules become attached to the extensive surface areas within its pores.

II.6.B. Pests

The fight against pests begins with an inspection to determine the actual risks. The building that houses the collections, and the surrounding area, are inspected, as well as the collections themselves, the tools and stored display apparatus (showcases, supports etc). The activities, working methods and habits of the personnel are also studied. This process must be repeated regularly and not considered an emergency measure. By doing this, the need to use chemical pesticides is reduced. In recent years, scientific research has shown that fumigation with gases known to be harmful to man, such as methyl bromide and ethylene oxide, can be replaced by fumigation in a controlled environment with O_2 equal to 0,1% and CO_2 above 60%. For certain types of insects and contaminated objects, the use of very low (-20^{o}C) or very high (60^{o}C) temperatures has also been proved useful. The approach described here, which can be described as the most ecological, uses the methods upon which the "Integrated Pest Management Plan" was based. This plan, developed in North America in the late-1980's, must be structured in a way so as to allow for the use of products that are not harmful to man, and it is based on the total control of the infestation (room by room, shelf by shelf, object by object).

At the same time, it takes an all-round approach to the structure and the collections. The stages of the plan can be summed up as follows:

1. Inspection to determine the presence of pests, recognise the indicators of the presence of insects, microorganisms or mould, and to measure the type and the extent of the infestation by particular species of insects using traps and adhesive strips.
2. Diagnosis and registration of data.
3. Planning of inspections, maintenance operations and work reorganisation in the rooms.
4. Application of the plan.
5. Valuation and actual changes in definitive strategy.
6. Maintenance programme.

The inspection concerns the building in its totality: the exhibition rooms and the storerooms, but also the administration, technical and service quarters, which could be the places of origin of the contamination, from which it has spread to other parts of the building.

II.6.C. Building and Architectural Constraints

The design and construction of a museum, or the adaptation of a space into a museum, are demanding operations because of three basic conflicting functions: to conserve, exhibit and educate. The building which houses the works acts as a barrier between the natural outdoor climate, which is uncontrollable, and the indoor climate (or microclimate), which in comparison to the former is artificial and controllable.

In other words, it acts to insulate the interior space, and at the same time interacts with the exterior climate. The degree of insulation of the building housing the collections depends on:

- its shape,
- its positioning (longitude and latitude, in the bottom of a valley, near the sea, in a windy place, a place exposed to high temperatures, in the shade, etc),
- the type of material and techniques used in its construction,
- the thickness of the walls and roof,
- the type of foundations,
- on the total area of glazed surfaces,
- on the orientation (north/south/east/west) and the type of door and window fixtures,

- on the existence (or not) of a maintenance programme.

Regarding a museum building, the lack of maintenance can be the cause of internal climatic instability, especially in the case of an historic building that has been adapted into a museum. All the parts of the building must be inspected so as to understand its all-round state of conservation. A maintenance programme can then be drawn up. If necessary, the inspection should be repeated every year. If a museum structure is effectively insulated and maintains a stable internal climate (i.e. it avoids large hygrometric variations between day and night, and between one season and another) and reduces the infiltration of dust and harmful gases, it will not be necessary to install an air-conditioning system. This is often considered the only solution to frequent and extreme hygrometric variations, but, at the same time, inspections (Fig.9.) to verify the building's state of conservation are often neglected. Likewise, maintenance programmes are often forgotten.

Fig.9. Asian museum professionals inspecting the building premises of the National Museum of Thailand, Bangkok. (© C.Menegazzi).

The infrastructures and equipments that are related to the museum building and surrounding gardens and other premises should be regularly inspected in order to be ready in case of an urgent need (Fig.10.).

Fig.10. Asian museum professionals inspecting the water pump of the National Museum of Thailand, Bangkok. (© C.Menegazzi).

II.6.D. Interaction Among Contact Materials

There is an interaction between the materials that make up the works on display, and the pedestals, showcases and containers in general. An understanding of the chemical and physical reactions that can be caused by contact between an object and the materials its container is made of is fundamental to a correct approach to preventive conservation. For example, an architect should avoid building a showcase from oak wood if it is going to be used to display objects made from, or partly made from, lead. Indeed, the fumes from the oak, especially if it is still fresh, attack the lead, turning it into a white dust, totally or partially destroying the objects. Hence it is important to avoid the risk of chemical reactions that may be detrimental to the conservation of the objects. In the same way, physical reactions should also be avoided. For example, works in polychrome wood, which have fragile surfaces, with the risk of the painted layer peeling off, should not be wrapped in polythene (because of electrostatics) for storage or a long journey. The plastic substance attracts particles from the painted surface which are ready to peel off. Therefore, before buying materials for building showcases or for long-term storage of objects, one should study the materials' composition so as to know about their possible interaction with the objects (Tétrault 1993).

A material which is compatible with artefact may not be absolutely inert, but its instability or the products it gives off may not represent a danger to the artefact with which it is used. Care must always be taken to ensure that the materials are compatible with the artefacts and that the artefacts are compatible with one another.

The compatibility of material with artefacts depends of the following variables:

- Museum objects:
  - nature of artefacts
  - age and condition
- Material:
  - nature of material (chemical composition)
  - concentration of chemical products
  - age of material
  - surface of the material (m^2)
- Context:
  - proximity of the artefact and the material
  (contact or non-contact)
  - air tightness of the environment
  (open or close system, ventilation and dimension of the system)
  - duration of living together
  - physio-chemical conditions:
  - cleanness of the artefact
  - relative humidity
  - temperature
  - ultraviolet and visible radiation

II.6.E. Security Systems

II.6.E.a. Anti-theft Devices

The choice of anti-theft systems and the positioning of devices to warn of intrusion do not make up a part of preventive conservation. Nonetheless, a detailed knowledge of the function and positioning of the system and devices, and of their maintenance programme, will assist in keeping both movable and immovable cultural heritage in a good state of conservation.

Regarding movable objects conserved in buildings (exhibition rooms or storerooms), careful consideration should be given to the choice of objects placed in areas at risk of intrusion (near doors or windows, in the attic etc) so as to prevent easy theft, by giving priority to large or heavy works, or those of inferior economic value.

Monitoring systems with cameras, centralised in "operational rooms" (Fig.11.), are often put in place to control the intrusions and the suspicious movements of visitors.

Fig.11. Operational room at the Uffici della Soprintendenza, lato sud, Scavi di Pompei. *(© A.Biasotti)*

II.6.E.b. Fire Protection

The same approach can be taken to fire prevention systems. Preventive conservation, as a discipline, involves the maintenance of warning systems and the inspection of fire extinguishers. To avoid short circuiting, water mist extinguishers should not be positioned close to the electrical fuse box. They should also not be placed near objects that are particularly sensitive to water. Powder-based extinguishers are more effective in this case, though they can cause damage if used on works with polychrome surfaces. In the case of fire, most museums have an evacuation plan for human beings, accompanied by fire instructions. Often the existence of the works themselves is forgotten. An evacuation plan for the objects in the case of fire should also be drafted, though this should also consider human safety. The museum personnel, from the security guard to the director, should know the guidelines and understand how to react. The evacuation plan should give priority to objects that are:

- more accessible,
- lighter,
- smaller or more manageable,
- more rare and/or representative,
- of greater economic value.

To minimise the risk of fire, archaeological sites and/or museum buildings should be inspected with the aim of eliminating all inflammable materials unnecessarily left in hidden corners or in rarely used spaces (Fig.12.).

Fig.12. The Rova Palais de la Reine burning in 1995, Antananarivo, Madagascar. (© Artline Films)

On archaeological sites in hot dry climatic zones, and in particular in rural areas, plant undergrowth should be cleared, as it can encourage fires, which have been started by smouldering cigarette ends thrown on the ground. Simulations and drills with the museum staff should be organised in collaboration with the local fire brigades. The use of fire extinguishers should became something familiar to the personnel (Fig.13. and Fig.14.)

Fig.13. Fire Brigade doing a drill with museum professionals from South East Europe, Ohrid, The Former Yugoslav Republic of Macedonia. (© C.Menegazzi)

Fig.14. Fire drill with museum professionals from South East Europe, Ohrid, The Former Yugoslav Republic of Macedonia. (© C.Menegazzi)

II.6.F. Human Factors

II.6.F.a. Lack of Personnel Training

Another aspect of preventive conservation that should not be undervalued is the training of all the personnel who work on archaeological sites or in museums. In addition to the practices listed above, every individual, according to the definition of their professional profile and responsibilities, should be instructed as to how to handle the objects, how to prepare packaging for long journeys or for storage, how to build the supports and holders, how to manage the storerooms and how to raise public awareness on the philosophy of preventive conservation.

In order to compense to this lack of staff training and lack of awareness in disaster risk management more than in just only preventive conservation, ICOM developed in 2002 a comprehensive programme.

II.6.F.a.1. The Museums Emergency Programme (MEP)[7]

After having explored and taken into consideration that many entities outside the cultural heritage world are involved and have a lot of experience in the risk management: the humanitarian organisations such as the International Committee of the Red Cross (ICRC), *Médecins sans frontières* (MSF); the Civil Defence; the military; the United Nations (UN) Organisations such as UNESCO, the United Nations International Strategy for Disasters Reduction (UN-ISDR)…; the insurance companies; the fireman, the public and private agencies such as the Federal Emergency Management Agency (FEMA), the Asian Disaster Preparedness Center (ADPC), etc; and being convinced that ICOM could learn from the above entities: the methodologies; the approach/philosophy; the network building, maintaining and renewing; the communication and awareness raising; the project designing, the partnership building; the experience and results sharing; the evaluating methods in the management of the human made and natural catastrophes, ICOM launched, in 2002, the Museums Emergency Programme as its institutional contribution in support of the Blue Shield mission.

[7] For further information, see http://icom.museum/mep.html

The Programme responds to the global need for museums to develop expertise in the areas of risk management. It emphasises training and collaboration within regional communities and at the same time tries to raise awareness on the vulnerability of museums and create self-sustained regional networks equipped with basic instruments and reference material.

Collaboration with specialised institutions at international and local levels has been and will be a priority in order to avoid overlapping of actions in the same field. The Blue Shield National Committees network, together with the National and relevant International Committees of ICOM: the International Committee for Conservation (ICOM-CC), the International Committee for Museum Security (ICMS), the International Committee for the Training of Personnel (ICTOP) the Getty Conservation Institute, ICCROM, UNESCO, the International Council on Archives (ICA), ICOMOS, the International Federation of Library Associations and Institutions (IFLA) and the International Committee of the Red Cross and other humanitarian organisations have played and will continue to play an active part in the development and implementation of the programme.

Clearly, consideration has been given to a variety of specific types of natural and man-made disasters, such as earthquakes, floods, hurricanes, tornadoes, volcanoes, armed conflict etc. Attention has also been given to constant underlying hazards at local level, which could provoke disasters. At the same time, it is important to recognise that the vast majority of emergencies facing museums around the world can be managed by a simple, practical, and affordable emergency plan that is understood by its museum employees and that will provide the structure and resources needed to respond.

Objectives and Specificities of the Programme

The aim of the programme is to advance understanding and awareness of the nature of disasters and how to limit and contain damage by using preventive conservation measures and rapid interventions in order to save cultural heritage.

The objectives are:

1. Learn from case studies and empirical research findings how rescue, salvage and aftermath operations can be co-ordinated to achieve maximum performance under intense pressure.

2. Improve research and strengthen the capacities of museum professionals in the field of emergency planning, disaster preparedness and response by taking into account all ecological implications, community involvement aspects, and by respecting local traditional techniques and methods.
3. Compare strategies, and share knowledge and insights on a world-wide scale.
4. Enable the creation of a proactive climate where contingency planning is a central element in the preparedness and response of disasters.
5. Produce, translate and diffuse tools in the form, for example, of specific web sites, slide kits, handbooks/guidelines on emergency planning, disaster preparedness and response for museums also available on the Web, etc
6. Train museum professionals in theory and field exercises to enable them to be prepared and respond to disasters.
7. Publish and communicate survey results on disaster preparedness and response.
8. Enable the creation of regional networks specialised in disaster preparedness and response for museums and capable of training other colleagues in their region.
9. Equip those networks with basic instruments and reference material for disaster preparedness and response.
10. Launch an awareness and fund-raising campaign in order to make regional networks self-sustainable.
11. Through the evaluation of the entire programme, identify new actions in order to spread the knowledge acquired.

The whole Programme will benefit from the contribution of a MEP Advisors Group formed by ICOM specialised members, non museum specialists, non cultural heritage specialists, by representatives of local communities that regularly suffer disasters, of the militaries, of the humanitarian organisations, of the UN agencies, all of them acting in disaster risk reduction and emergency management.

Clearly, consideration is given to a variety of specific types of natural and man-made disasters, such as earthquakes, floods, hurricanes, tornadoes, volcanoes, armed conflict etc. Attention is also given to climate change, to constant underlying hazards at local level (pest, extreme climate, etc.) which could provoke disasters. At the same time, it is important to recognise that the vast majority of emergencies facing museums around the world can be

managed by a simple, practical, and affordable emergency plan that is understood by its museum employees and that will provide the structure and resources needed to respond.

Local traditions for the mitigation of risks and community involvement

One of the specificity of MEP is the respect for local traditions and for cultural diversity through the involvement of local communities in the development of disaster risk reduction strategy for cultural heritage.

Throughout the whole programme, traditional – and sometimes forgotten- mitigation measures to manage risks have been identified, collected, shared and discussed. In occasion of the MEP Training course developed in Asia some local traditional mitigation measures traditional mitigation measures have been identified (Table 0.).

Table 0. Traditional Mitigation Knowledge

COUNTRY NAME	TYPE OF HAZARDS	METHOD INFORMATION
CAMBODIA	Flood/Humidity Pest	• Tobacco tramped in water to put on the surface of the wooden object (after a flood against mould) • Birds of prey against bats
INDIA	Pest Pest and water Water/Flood Rats Fungus and pest Earthquake and tsunami	• Dried neem leaves. For books, you put them inside the pages. For textiles, you put between the layers of the folder of textiles. For wood and for any organic material. • Peacock feathers to prevent insect and lizards. Only one feather is enough for one room exposed on the wall. • Linseed oil for the preservation of wooden object displayed in open areas will present from insect attack and from humidity. • Make the landscape in such a way that the water should flow in other direction not entering in the exhibition and/or storage area. • Pieces of papaya fruits displayed in the room where organic material is displayed. • Natural camphor for organic materials. • Look at the behaviour of animals.
SRI LANKA	Pest	• Resin oil exposed to the air for old books, old printed maps; • camphor exposed to the air and display cases for textiles and other organic material, • linseed oil (dorana) applied like varnish on the paintings against moisture and dust; • and cinnamon oil exposed in the air (for books and manuscript)
TURKEY	Physical Forces	• Half-timber houses as consolidation technique in earthquake region • Fixing technique for fragile objects • Objects packing and storing methods
PAKISTAN	Physical Forces	• Half-timber houses as consolidation technique in earthquake region
SAMOA	Physical Forces	• Traditional houses on wood and ropes against wind and hurricanes • Traditional windows against wind and hurricanes
JAPAN	Pest	• To expose to air (in shadow) in summer or autumn books and/or objects normally in storage, so as to prevent from insect attacks.

Whether in a museum or another site within a community, the protection and security of cultural heritage will be the responsibility of a diverse group of people both within and outside of the institution. These include personnel responsible for administrative, technical and support duties, as well as local, national or regional emergency responders (i.e., fire and rescue departments, regional emergency prevention units, the Red Cross, etc.), and various community 'stakeholders'. The alliance of these groups of individuals is critical to the creation of viable and sustainable integrated emergency management strategies for cultural heritage. Therefore, while the MEP programme has been developed primarily for the museum personnel, it intends to bring them into contact with other cultural heritage and emergency professionals as well as community representatives with whom they must engage.

Integrated Emergency Management approach

The Programme will focus on risk assessment, emergency preparedness, response and recovery— or integrated emergency management— for museums and other cultural institutions.

This approach has been developed considering all the aspects that are associated to museum risk management, such as: the local landscape and environment, the building, the premises, the staff, the public, the stakeholders and local communities, the decision makers and the collections.

The new element that has been introduced into the Integrated Emergency Management approach is that the collections have to be considered as composed not only by the objects themselves, but also by their documentation (inventory, catalogue, pictures…) and their related intangible heritage aspects (such as the oral knowledge about the use of an object during rituals, or about a method of conservation and about a technique of creation). Therefore the museum emergency plans that result from an Integrated Emergency Management approach have to include some actions and budget, among their priority lists, also to the safeguard of the inventories and the intangible heritage concerned by the object items of the collections.

Structure of the Programme

The Museums Emergency Programme is a long-term programme divided into modules, which cansometimes be considered as parallel processes:

Module 1 – Survey and Research

Module 2 – Conferences and Symposia

Module 3 – Support Tools

Module 4 – Education/Training

Module 5 – Strategic Alliances

Module 6 – Awareness Raising and Communication

Module 1-Surveys

This module started first with a survey to understand the state of the art of museums in the world as far as the disasters and risk management is concerned. A questionnaire[8], in several languages, was sent in 2002 to about 2000 museum professionals and museums all over the world in order to identify the persons directly implicated in a catastrophe in a museum, and to collect information about which museums have already been affected by a catastrophe (human or natural); about the already existing institutions/associations operating in the field of emergency preparedness and response; about the programmes and activities already organised or planned in this respect. The process of collecting information is still on going.

A statistical analysis of the 172 answers received from 57 countries all over the world has been undertaken. 32% of the museums, which responded, are located in a high risk area: flooding and earthquake are the major risks identified. Only 12% of the museums indicated that are located in a zone of political conflict. 38% of the museums have an evacuation/emergency plan for their collections. 30% of the museums have experienced a disaster in the last fifty years.

By analysing the survey results some interesting case studies have been identified, such as the National Museum in Kabul, Afghanistan (war); the Zemaljski Muzej Bih in Sarajevo, Bosnia and Herzegovina (war); the Museo Arqueológico in Sogamoso Boyaca, Colombia (earthquakes and forest fires); the Musée National du Togo in Lome, (flooding); the Musée de la Gendarmerie Nationale in Moramança, Madagascar (tropical low pressure)… as well as persons directly involved in a catastrophe in a museum.

Information has been collected on the already existing institutions/associations operating in the field of emergency preparedness and response; the programmes and activities already organised or planned; the professionals already trained or suitable to be trained for emergency

[8] See Annex II.d.

preparedness and response; the scientific materials already existing and in which format and language they have been collected as well as bibliographies and literature such as books, essays and articles, and didactic material and existing web sites on disaster preparedness and response.

Two case study missions were organised in 2003 in Venezuela and in Madagascar in order to study more in depth the situation of countries concerning the risk preparedness and response related to museums, by meeting the local authorities in charge of the risk management and planning and the local museum professionals in charge of the protection of the collections, collecting existing documentation related to disasters (local case studies, reaction, publication, training activities, etc.); to identify resource people for future developments of the programme and to evaluate the possibility of organising in the country a future training workshop for the region.

In addition to that a research component has been added in order to give more consistency to the whole programme. The direct involvement of ICOM International Committees is requested; new partnerships with research institutions and Universities are expected. The Museums Risk Map will be created, where the most vulnerable (crossing cultural heritage and risks zones) regions in the world will be identified.

Module 2 - Conferences/Symposia

This is the module that gives more emphasis to the personal contacts. Professionals meet to discuss new area of research, of actions, etc. This module regards also the development of international, regional, local declarations, charters, recommendations… that give the orientations for future actions. The personal contacts will allow the creation of new partnerships and/or working collaboration.

The first activity under Module 2 was the "International Symposium on Cultural Heritage Disaster Preparedness and Response" that took place in India, Hyderabad, at the Salar Jung Museum from 23rd to 27th of November 2003. Its objectives were: to establish a network of museum professionals (curators, security officers, directors, technicians…) who have had first hand experience with catastrophes, and a network of specialists on heritage emergencies all over the world who could collaborate in disaster situations especially in co-ordination with ICBS; to identify proposals and resource persons for the other modules of the programme; to

review the evolution of the research in the fields of education, management, legislation, methodologies and techniques concerning disaster preparedness and response, and to produce recommendations on movable heritage emergencies, stressing legal and Government decisional aspects and public involvement.

Various case studies were presented during the plenary sessions of the Symposium, from concrete "first-hand" experiences like those reported by Pavel Jirásek, Chair of the International Committee of ICOM for the Museum Security, concerning the flood in Prague in 2002, by Franz Grupp from Peru, concerning the earthquake of 2001 in Arequipa or by Corine Wegener about her personal networking collaboration in wartime at the Iraq National Museum of Bagdad; to "cross profile interventions" such as that of Jan Hladik from UNESCO on international legislation in support of the protection of cultural property in the event of armed conflict, and that of Manuel López from *Médecins sans frontières* about the key issues in emergency projects from the humanitarian point of view.

During the working group sessions[9], the participants developed recommendations that can be summarised as follows:

- A dialogue between different cultures should be established in order to communicate the value of cultural heritage and the need for direct implication of the entire population for the protection of the cultural heritage;
- A dialogue, a collaboration and a coordination of efforts should be implemented among different cultural heritage organisations and cross-profile professional entities in order to broaden the scopes of the MEP and to create a synergy of activities concerning the cultural heritage and the broader disaster risk reduction strategies;
- ICOM and its specialised International Committees have been requested to start acting on the field;
- ICBS and its National Committees should develop more as functional and operational structures for response to emergency situations;

[9] Each working group session was accompanied by a pertinent introduction to the discussion themes identified in advance. The themes of the working groups were:

- Community responsibility and involvement in emergency preparedness and response,
- Preserving the environment and local traditions in emergency preparedness and response,
- Networking: coordination and collaboration among diverse institutions and organisations in emergency preparedness and response.

- Cultural emergency response teams need an operational support structure drawing on the experience of organisations such as *Médecins sans frontières*, the International Committee of the Red Cross/Red Crescent and others;

The second activity was the "International Symposium on Cultural Heritage Protection" held on 23 June 2006 in Seoul, South Korea during which ten institutions from Asia, participating into the MEP-Teamwork for Integrated Emergency Management (TIEM) Course, presented the results of their risk management actions undertaken in their institutions.

Module 3 – Support Tools

This module concerns the creation, translation and adaptation to different cultural and geographic situations, of support/didactic materials/tools (in all formats: on line, paper...) on integrated emergency management.

The MEP on line bibliography[10] hosted by the GCI is constantly alimented by the contribution of ICOM International Committees such the one for security, conservation, military museums, training, etc.

Module 4 – Education Training

"Teamwork for Integrated Emergency Management (TIEM) course[11]"

Before developing the TIEM course curriculum, the three partners had undertaken research, at an international level, about training activities concerning risk management and in particular those programmes addressing museums professionals. Apart from the material already developed by the MEP partners, information was gathered on professional educational programmes ranging from a two days' hands-on course organised by the University College of London (UCL) Centre for Sustainable Heritage-Bartlett School of Graduate Studies in London in 2003 to distance education courses organised by the University of Victoria under the Cultural Resources Management programme for the year 2005 and 2006. Another example is the *Instituto Nacional de Antropología e Historia* (INAH) in Mexico which developed, in May and June 2003, a course on disaster management mixing a one week

[10] For consultation, see the following link: http://gcibibs.getty.edu/asp/

[11] The TIEM course is a result of a teamwork among the three partners institutions: ICCROM, the Getty Conservation Institute and ICOM with the fundamental support of the instructors/mentors of the course.

workshop at the beginning of the course with a one month of distance learning. The University of Dundee in Scotland organised in 2002 a one day workshop on disaster management including a virtual flood simulation. The participants had also access to a Web site and Web Board interactions.

The International Council of African Museums (AFRICOM), in 1999 during its Constituent Assembly retained as a priority, among others, the training on heritage risk protection. Specialised training institutions in Africa as the *Ecole du patrimoine africain* (EPA) and the Centre for Heritage Development in Africa (CHDA)[12] include in their training courses elements of risk management integrated to the curriculum of most of their courses as also ICCROM does in courses in Asia and Latin America and other regions.

Several workshops, seminars and symposiums on risk management have been organised and are scheduled for the next years. For example: part of the Museum Forum organised in occasion of the 14th Triennial Meeting of the International Committee of ICOM for Conservation, in The Hague, The Netherlands in September 2005 was dedicated to "Museums and Emergency Situations"; while the theme of the annual meeting of the Museums Association of the Caribbean (MAC), which took place from 25th to 27th October 2005, in St. Croix, US Virgin Islands was "How museums and cultural institutions handle disasters".

The first Teamwork for Integrated Emergency Management course was implemented in three phases over the span of an eight-month period of collaborative learning and capacity building from August 2005 to March/June 2006.

- Phase 1: two-week Introductory Workshop took place in Bangkok, Thailand, in August 2005, during which the TIEM curriculum topics started to be approached.
- Phase 2: Distance Mentoring and Practical Work at the participants' museums, from September 2005 to March 2006, during which an intranet web site was available for communication and as a learning tool to explore the museums risk assessment and the basic steps of an emergency plan.
- Phase 3: one week Final Review Workshop, June 2006 in Seoul, South Korea, during which the evaluation process of the outcomes of the course started.

[12] Since September 2, 2005 the "Programme for Museum Development in Africa" PMDA has changed its name to "Centre for Heritage Development in Africa" (CHDA) because its mandate has widened to cover all heritage:- movable, immovable, intangible, archival, etc.

The second TIEM course was undertaken in South East Europe in 2007 and 2008.

TIEM curriculum topics

The curriculum takes into account the fact that institutions have differences in resources, size, culture, traditions, etc. Teaching therefore emphasises how museum teams can adapt approaches to integrated emergency management to their particular situations. These are the curriculum topics that have been considered for the two courses, that, according to different context and regions, is intended to be adapted and modified: an introduction to the concept of integrated emergency management addressing the museum buildings, the collections and institutional operations; the terminology and definitions; the integrated emergency management process/cycle; the different types of risks and their nature; the risk analysis exercise; the methodologies for risk and vulnerability assessment; the risk perception; the creation of professional and technical alliances with local/ national/regional emergency preparation and response providers; the creation of local support and alliances: social, political, economic; the development and implementation of emergency plans and strategies before the emergency (prevention and mitigation), during the emergency (response actions) and after the emergency (recovery); the risk transfer: insurance consideration for museums; the building maintenance strategies; the techniques for handling the collections; the aids for emergency response planning; and the local tradition(s) for the mitigation of risks.

Specificities of TIEM course

The partners tried to develop a course, which could offer something different and/or complementary to other training offers on the same subject. For the time being, some specificities have been identified, which give to the TIEM course its *raison d'être* towards the protection of cultural heritage:

<u>Two Universities participating in the course for a local development and diffusion of the training methodology</u>

In order to spread out the TIEM course approach and methodology at national and regional level two Universities are invited to participate during the all duration of the course. By being training institutions, they are able, during the overall process and for the final evaluation, to contribute to the improvement of the programme by identifying lacunas in the curriculum

topics and also to the general course approach and by giving more emphasis to the local geographical and cultural diversity.

Regional approach

The TIEM course has been launched in Asia that for being a very big and complex region has resulted to be a perfect ground for the TIEM approach testing. The language diversity has been transformed from an expected difficulty in communication in an asset for the development of meta-communication tools such as: hands-on exercises, mock exercises, simulations, illustrated case studies, etc.

Two Institutions participating from another region

The participation of two Institutions from another region contributes to an extra-regional dialogue and confrontation and to the identification that, in the risk management field, some issues are common beyond the frontiers and can be approached in different ways.

Diversities among the participating museums

The participants of the course are institutions rather than individuals in order to obtain a major local sustainable effect and to implicate the trained institutions in training other museums in the same region. The participating museums are all National Museums with many common problems in spite of their diversity: different type of collection (natural science, fine arts, ethnographic…); different socio-economic background; different size as far as the staff is concerned; different organisational framework; different kind of museum (museum in the University- The Philippines; University system in the Museum -Osaka Museum; Echo-museum…); different building composition (one single building to many and differentiated buildings); different age of the building (recent-modern or historic house…)…

Respect for local traditions

The TIEM approach emphasises the importance of respecting local traditions in risk management. Throughout the whole course, traditional – and sometimes forgotten- mitigation measures to manage risks are identified, collected and discussed.

Teamwork in the participating museums

Each participating museum creates a team of people who will act as the risk management committee. This committee should be composed of people who represent the main functions

of the museum. They, in turn, will put together teams with responsibility for safety/security, collections, the buildings (including its systems and equipment), and administration/ records.

Team of instructors: multidisciplinary, intercultural, etc.

Teachers for the workshops include professionals from the heritage and security/ risk management fields coming, especially but not exclusively, from the region where the training activity is put in place. Instructors for the TIEM course are specialists with substantial experience in one or more of the topics covered by the curriculum. The course's team of instructors therefore combines a range of experience, reflecting regional as well as international perspectives and practice. Some participants of the courses could become instructors in next courses organised in another region of the world.

Theory, case studies, hands-on exercises

The Integrated Emergency Management curriculum is realised through a combination of classroom-based teaching, mock exercises and hands-on exercises (Fig.15.) with distance learning and practical work that will be carried out at participants' own institutions. The curriculum engages participants in the processes associated with various aspects of integrated emergency management, and allow them to adapt and implement locally sustainable approaches to emergency preparedness. Participants gain experience performing an institutional risk assessment, forming contacts with emergency and security personnel, and developing an emergency plan corresponding to the specific situation of the institution.

Fig.15. Rescue hands-on exercise. TIEM Course in Asia. (© C.Menegazzi)

A National Museum at disposal for mock exercises, handling, etc.

The TIEM course has been conceived with the underlying idea of having a Museum, or part of it, available for use for the total duration of the training. During the distance mentoring phase, each participant has its own museum available for use in risk assessment and other activities. During the Workshop phases a museum is also available to put into practice immediately the lessons learned and to organise handling activities, to inspect the museum building and the premises, to organise mock exercise in a real museum context, etc.

Course facilities during the course

During the phase 1 workshop a "Library" is at disposal of the participants with examples of emergency plans from all over the world and specialised literature. Instructors, mentors and participants have also access to the MEP online project bibliography, which includes citations of publications (in either print or web-format) on various aspects of integrated emergency management. The Teamwork for Integrated Emergency Management course web site – accessible to the partners, instructors and participants – is set up to support the work of the second phase of the course.

Duration: 8 months through a combination of workshops and distance-mentored learning

Acquiring knowledge and skill in integrated emergency management is a long-term process that cannot be effectively supported through short courses or workshops. For this reason, the TIEM curriculum is realised through an eight-month course that combines two classroom-based workshops with a program of coordinated and mentored capacity-building activities that is pursued by participants within their own institutions. These activities allow participants to engage in the processes associated with integrated emergency management, and to adapt, put into practice, and test locally the various ideas and information presented during the workshops. Throughout all phases of the courses, participants maintain contact with other colleagues, particularly those who may be able to provide support through advice or mentoring. This particular educational model allows the heritage personnel who participate in the TIEM course to gain knowledge, skill and confidence within a framework of increased thinking and problem solving over time.

Institutional commitment

The participants of the course are drawn from museums that demonstrate a willingness to undertake risk assessments and emergency preparedness within their institutions, and that

make a commitment to devote staff to this effort over an eight-month period. Agreements with the institutions' directors are stipulated.

Community involvement

Whether in a museum or another site within a community, the protection and security of cultural heritage will be the responsibility of a diverse group of people both within and outside of the institution. These include personnel responsible for administrative, technical and support duties, as well as local, national or regional emergency responders (i.e., fire and rescue departments, regional emergency prevention units, the Red Cross, etc.), and various community 'stakeholders'. The alliance of these groups of individuals is critical to the creation of viable and sustainable integrated emergency management strategies for cultural heritage. Therefore, while the TIEM curriculum will be developed primarily for the training of museum personnel, it intends to bring them into contact with other cultural heritage and emergency professionals as well as community representatives with whom they must engage.

Module 5 – Strategic Alliances

The fifth module of the Programme focuses on the creation of regional networks specialised in disaster risk management for museums and able to train other colleagues in their region. In the countries where National Committees of the Blue Shield already exist, they will serve as reference.

Module 6 - Awareness Raising and Communication

The sixth module concerns the launch of awareness raising campaigns in order to make regional alliances-self sustainable, to make response actions possible when a disaster strikes a country or a region and to implement prevention activities to limit the possible damages.

II.6.F.b. Illicit Traffic

Several organisations are involved in international awareness-raising campaigns and capacity building activities together with other protagonists in the fight against illicit traffic of cultural property. Here are some of the most active: UNESCO; ICOM; Interpol; Federal Police, Property Crime Division, Art Unit, Belgium; National Police, Investigation Group on Crime against Cultural Heritage, Colombia; Central Office for the Fight against Traffic of Cultural Property (OCBC), France; Carabinieri Forces, Italy; Federal Office of Police (Fedpol), Switzerland; Federal Bureau of Investigation, Art Theft Program (FBI), United States; Scotland Yard, Metropolitan Police, Art and Antiquities Unit, United Kingdom.

Agreements have been signed in order to improve this co-operation:

- On 25 January 2000 in Brussels, ICOM's president and the World Customs Organisation (WCO) signed a "memorandum of understanding" to cooperate in the fight against illicit trafficking in cultural property.
- On 11 April 2000, ICOM also signed an "official agreement for cooperation" with Interpol.

The cooperation in this field especially lies in forwarding information, elaborating joint awareness-raising tools and campaigns, providing training programmes for customs officers, and diffusing ICOM's publications for the fight against the illicit art trade amongst police and customs departments worldwide.

Specific mention of the close collaboration between ICOM, Interpol and other crime fighting organisations can be made. In the summer 2006, thanks to the rapid action and relay of information between ICOM, Interpol and the FBI of the United States of America, more than 600 cultural artefacts which had been illegally taken from Ecuador were seized and returned to that country.

There are two fundamental international conventions for the protection of the world's tangible heritage:

- The UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property (1970).
- The UNIDROIT Convention on Stolen or Illegally Exported Cultural Objects (1995).

The 1970 UNESCO Convention binds States which have ratified it to take the following measures: to prevent museums inside their boarders from purchasing cultural objects which have been illegally exported; to forbid the import of cultural property that has been stolen from a museum or a public institution after the Convention has come into force; if there is a request from the country of origin, to seize and return cultural artefacts stolen and imported in this way. But the Convention is not retroactive and thus it takes effect only from the very date of its official ratification.

The UNIDROIT Convention complements the 1970 Convention. In particular, it includes the clause which determines that everyone who is in possession of a stolen cultural artefact must return it, whatever the circumstances. This rule compels purchasers to exercise due diligence in checking the objects that have been offered for sale on the art market.

Both conventions together provide an international prescriptive framework which could prove very effective, but to date still too few States Parties have ratified these conventions. The main reason for this lies in the important financial issues at stake: countries whose heritage has been looted are often the ones with the most serious socio-economic difficulties, and thus with few resources to grant to procedures and compensations. On the other hand, in the buyer countries, those profiting from the art market apply pressure to preserve very profitable trade terms.

Considering all these aspects, it seems that at the moment the action should focus on prevention against illicit traffic by encouraging the ratification of both conventions by the governements that haven't signed yet.

II.6.F.b.1. Tools against Illicit Traffic

The "Red Lists" are ICOM General Secretariat's pubblications to combat illicit trafficking in cultural property. The last one is the "Red List of Cambodian Antiquities at Risk" that has been drawn up to prevent cultural objects being sold illegally on the art market, and thus to ensure the protection of Cambodia's heritage. It is based on the ICOM Red List concept, and is the sixth in the series of nine so far, to be published by the end of 2010. The photographs that illustrate the categories are not reproductions of stolen objects, unless, in certain rare cases, they are designated as such. The "Red Lists" are compiled to draw attention to categories of objects which are frequently the target of illicit excavations, looting and other.

ICOM has already published Red Lists for the following countries and regions:

- Red List of African Archaeological Objects (2000)
- Red List of Latin-American Cultural Objects at Risk (2002)
- Emergency Red List of Iraqi Antiquities at Risk (2003)
- Red List of Afghanistan Antiquities at Risk (2006)
- Red List of Peruvian Antiquities at Risk (2007)
- Red List of Cambodian Antiquities at Risk (2009)
- Red List of Endangered Cultural Objects of Central America and Mexico (2009)

In addition, two new ICOM Red List projects are under way for publishing in 2010, for Colombia and China respectively.

Many cultural items have been seized by police and customs units using the ICOM "Red Lists", which demonstrates the efficiency of these tools to combat illicit trafficking in cultural property. Some examples are reported below:

- In 2000 at the European Fine Art Fair in Maastricht, two Nok statuettes were identified and removed from a Belgian dealer's stall.
- In April 2000, after the Embassies of Niger and Nigeria in France had lodged a complaint, fourteen statuettes (Nok, Sokoto and Katsina cultures) coming from Nigeria and three others (Bura culture) from Niger, were seized at an auction at Drouot in Paris. They were impounded pending the court's verdict.
- In 2005 at an Interpol meeting, the South-African police presented the case of a seizure that hey had operated at a trafficker's premises.
- In January 2006 a foundation nail from Iraq was identified at an auction at Drouot. The Parisian public prosecutor's office opened an inquiry further to the request from the Permanent Delegation of Iraq to UNESCO.
- In March 2006 more than six thousand items which had been stolen from archaeological sites in Niger and seized by French customs in 2004 and 2005, were handed back to their country of origin.
- In 2008 an Iraqi cuneiform tablet was identified on the Swiss web platform of eBay. Swiss authorities were alerted and eBay stopped the sale a few minutes before the end of auctions.

In 2008 French customs seized a shipment coming from Togo which contained Nigerian artefacts. A thermoluminescence test carried out by the Laboratories of French Museums showed that one of the items was an authentic Nok. Its restitution to Nigeria is underway.

The “ICOM Code of Ethics for Museums” (ICOM, Paris, 2006) was prepared in accordance with the Ethics of Acquisition (1970) and the ICOM Code of Professional Ethics which was adopted in 1986 and revised in 2004. The Code is the cornerstone of ICOM as it sets minimum standards of professional practice and performance for museums and their staff. It thus reflects principles which are generally accepted by the international museum community. In joining ICOM, members undertake to abide by this Code. Amongst others, the Code contains articles on acquisition and de- accessioning from museum collections, identification of illegally or illicitly acquired objects and the return and restitution of cultural property.

The ICOM “One Hundred Missing Objects” series outlines cultural objects which have been stolen and declared to the police. Each of these objects is illustrated with a photograph together with a detailed description and its Interpol registration number. These publications have enabled the identification, seizure and return of several objects to their countries of origin. The series includes:

- One Hundred Missing Objects, Looting in Angkor (1993, re-published in 1997)
- One Hundred Missing Objects, Looting in Africa (1994, re-published in 1997)
- One Hundred Missing Objects, Looting in Latin America (1997)
- One Hundred Missing Objects, Looting in Europe (2001)
- One Hundred Missing Objects, Looting in Arab Countries (in preparation)

At least seven objects were identified and returned to Cambodia thanks to the publication focusing on the Khmer Angkor site. About ten archaeological items coming from Africa were located and returned to their country of origin. “Looting in Latin America” played a primary role in the seizure of approximately 600 pre-Hispanic artefacts in July and September 2006 in the United States and Ecuador. At least six religious artworks have been returned to their European country of origin. Other artefacts have been located and identified but they remain the object of negotiations between current owners and the countries or institutions which claim their restitution. Persons and institutions wishing to reach an amicable agreement may have recourse

The “Object Identification” (Object ID) international standard has been designed as a tool to counter illicit trafficking in cultural property. It contains eight fields used to provide essential information on archaeological, artistic and cultural objects, in order to enable the identification of stolen objects. Interpol itself uses Object ID as the cornerstone of their stolen objects database.

II.6.F.c. Wars

II.6.F.c.1. The Hague Convention

The Convention for the Protection of Cultural Property in the Event of Armed Conflict adopted at The Hague (Netherlands) in 1954 in the wake of massive destruction of cultural heritage during the Second World War is the first international treaty with a world-wide vocation focusing exclusively on the protection of cultural heritage in the event of armed conflict.

It covers immovable and movable cultural heritage, including monuments of architecture, art or history, archaeological sites, works of art, manuscripts, books and other objects of artistic, historical or archaeological interest, as well as scientific collections of all kinds regardless of their origin or ownership.

The Convention was adopted together with a Protocol in order to prevent the export of cultural property from occupied territory, requiring the return of such property to the territory of the State from which it was removed.

The destruction of cultural property in the course of the conflicts that took place at the end of the 1980s and the beginning of the 1990s, highlighted the necessity for a number of improvements to be addressed in the implementation of the Hague Convention. A review of the Convention was initiated in 1991, resulting in the adoption of a Second Protocol to the Hague Convention in March 1999. In November 2009 the Operation Guidelines to the Second Protocol have finally been approved .

The States that are party to the Convention benefit from the mutual commitment of more than 115 States with a view to sparing cultural heritage from consequences of possible armed conflicts through the implementation of the following measures:

- Adoption of peacetime safeguarding measures such as the preparation of inventories, the planning of emergency measures for protection against fire or structural collapse, the preparation for the removal of movable cultural property or the provision for

adequate *in situ* protection of such property, and the designation of competent authorities responsible for the safeguarding of cultural property;

- Respect for cultural property situated within their own territory as well as within the territory of other States Parties by refraining from any use of the property and its immediate surroundings or of the appliances in use for its protection for purposes likely to expose it to destruction or damage in the event of armed conflict; and by refraining from any act of hostility directed against such property;
- Consideration of the possibility of registering a limited number of refuges, monumental centres and other immovable cultural property of very great importance in the International Register of Cultural Property under Special Protection in order to obtain special protection for such property;
- Consideration of the possibility of marking of certain important buildings and monuments with a distinctive emblem of the Convention;
- Establishment of special units within the military forces to be responsible for the protection of cultural property;
- Sanctions for breaches of the Convention; and,
- Wide promotion of the Convention within the general public and target groups such as cultural heritage professionals, the military or law-enforcement agencies.

II.6.F.c.2. The International Committee of the Blue Shield

The Blue Shield is the symbol (Fig.16.) specified in the 1954 The Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict[13] to mark cultural sites during wars or attacks in order to protect them (Fig.17.).

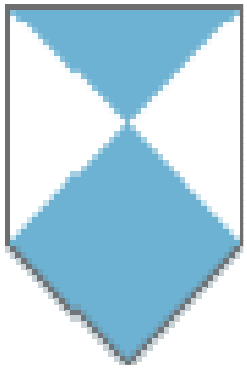

Fig.16. Distinctive emblem of The Hague Convention and Logo of the Blue Shield. (ICBS and ANCBS).

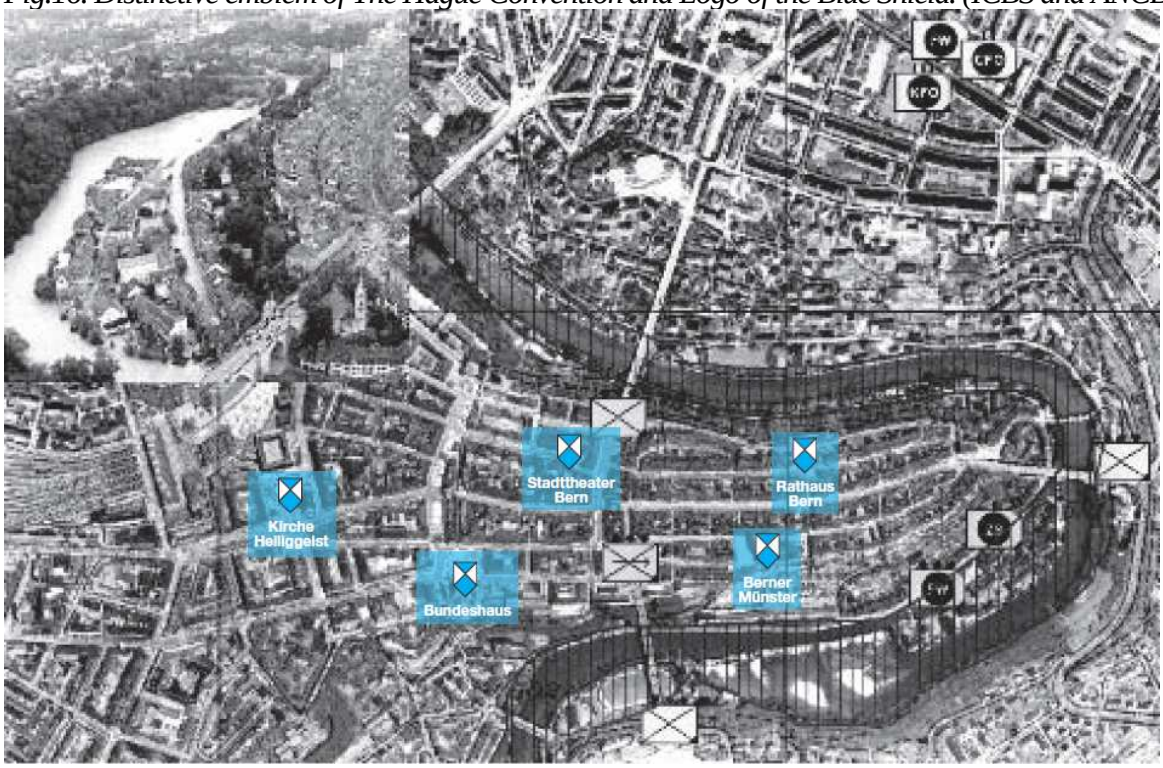

Fig 17. Preventive marking of cultural sites. (© ÖBH)

It is also the name of the international committee set up in 1996[14] to work to protect the world's cultural heritage threatened by wars and natural disasters: the International Committee of the

[13] See http://www.unesco.org/culture/laws/hague/html_eng/page1.shtml

[14] The founding objectives of the ICBS can be found in its Charter concluded in Strasbourg on 14 April 2000 - http://www.ifla.org/VI/4/admin/nc-req.htm.

Blue Shield. ICBS, is recognised in Article 27, Section 3[15] of the 2nd Protocol of The Hague Convention.

The ICBS[16] covers museums and archives, audiovisuals, libraries, and monuments and sites. It brings together the knowledge, experience and international networks of the five expert non-governmental organisations dealing with cultural heritage: Co-ordinating Council of Audiovisual Archives Associations (CCAAA), ICA, ICOM, ICOMOS and IFLA. In addition, UNESCO has a working relationship with ICBS while ICCROM is an organisation with consultative status with ICBS. The mission of the ICBS is to work for the protection of the world's cultural heritage by co-ordinating actions to meet and respond to emergency situations.

Its objectives are:

- to encourage its members to ask their governments to sign and ratify the Convention and its Protocols;
- to facilitate international responses to threats or emergencies threatening cultural property;
- to encourage safeguarding and respect for cultural property especially by promoting risk preparedness;
- to train experts at national and regional level to prevent, control and recover from disasters;
- to act in an advisory capacity for the protection of endangered heritage; and
- to consult and co-operate with other bodies including UNESCO, ICCROM and the Red Cross and Red Crescent Movement.

The five organisations have decided to work together to prepare for, and respond to, emergency situations in case of both armed conflicts and natural disasters that could affect cultural heritage. In doing so they respect the following principles: joint actions,

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[15] Article 27 Functions, 3. The Committee shall co-operate with international and national governmental and non-governmental organizations having objectives similar to those of the Convention, its First Protocol and this Protocol. To assist in the implementation of its functions, the Committee may invite to its meetings, in an advisory capacity, eminent professional organizations such as those which have formal relations with UNESCO, including the International Committee of the Blue Shield (ICBS) and its constituent bodies. Representatives of the International Centre for the Study of the Preservation and Restoration of Cultural Property (Rome Centre) (ICCROM) and of the International Committee of the Red Cross (ICRC) may also be invited to attend in an advisory capacity.

[16] See http://www.ancbs.org/index.php?option=com_content&view=frontpage&Itemid=1

independence, neutrality, professionalism, respect of cultural identity, and work on a not-for-profit basis.

It is vital that the international initiative is taken up and supported by local initiatives. National Blue Shield Committees have been formed in 15 countries Australia, Chile, Benin, Madagascar, Belgium, Czech Republic, France, Israel, Italy, the Former Yugoslav Republic of Macedonia, Netherlands, Norway, Poland, United Kingdom and Ireland and United States of America; in more than 20 countries committees are under construction (such as Brazil, Canada, Peru, South Korea, …) National committees bring together the different cultural professions, national government, the emergency services, the humanitarian organisation such as Red Cross and *Médecins sans frontiers*, the civil protection, the fire brigades and the armed forces.

National Blue Shield Committees provide a forum to improve emergency management by sharing experiences and exchanging information and for raising national awareness of the threats to cultural heritage. And last but not least, they promote the ratification and implementation by national governments of the 1954 The Hague Convention and its protocols.

In the recommendation n°5 of the First Meeting of the States Parties to the Second Protocol to The Hague Convention, which took place in Paris, on 26 October 2005, it is written that ICBS will be invited to participate to the First Meeting of the Committee for the Protection of Cultural Property in the Event of Armed Conflict in October 2006 and thereby to assist the States Parties in taking up their responsibilities in view of the convention. Since than, the ICBS took part to all the meetings of the States Parties and to those of the Committee until the last ones on 23rd and 24th November 2009, at UNESCO, in Paris.

The first Blue Shield International Meeting was organised on 23rd and 24th July 2004 in Torino, Italy, during which resolutions were produced[17], addressed to governments, the United Nations and specialised international organisations on the protection of movable and immovable cultural heritage.

[17] See http://www.ifla.org/VI/4/admin/torino-declaration2004.pdf

On 27th and 28th September 2006 the second Blue Shield Conference took place in The Hague, Netherlands on the theme: "Towards a Solid Organisation: Infrastructure and Awareness"-The challenge of an effective cooperation[18].

It is obvious that the five existing cultural heritage Non Governamental Organisations (NGO) constituting the ICBS have their own specificity by dealing with different kind of heritage: books, monuments, museum objects, audiovisuals, archives…

It can be found in all NGOs missions[19], in a more or less extensive way, some common points such as: the world wide distribution of the activities and the fundamental interest in the preservation of the cultural heritage in all its representation.

In addition to that, IFLA has created in 1984 the Core Activity on Preservation and Conservation (PAC)[20] to focus efforts on issues of preservation and initiate worldwide

[18] A new purpose and new functions for the ICBS have been drafted on that occasion and amended on 28th September 2006 by the representatives of the 5 founding partner organisations:
Purpose of the ICBS
To promote the protection of cultural property (as defined in the Hague Convention) against threats of all kinds and intervene strategically with decision makers and relevant international organisations to prevent and to respond to natural and man made disasters.
Functions of the ICBS

- To promote the ratification and implementation of the Hague Convention and its protocols, with the emphasis on advocating ICBS's philosophy and principles;
- To encourage the establishment of national Blue Shield Committees;
- To recognise/de-recognise national Blue Shield Committees;
- To represent the Blue Shield at UNESCO, and in particular to participate in the Committee established by the 2nd protocol of the Hague Convention and in other work associated with this Protocol, and to maintain relations other international agencies;
- To liaise with ICRC (Red Cross)and ICCROM, as other bodies referred to in the 2nd Protocol, and with other high-level bodies;
- In combination with the Association of Blue Shield National Committees, to ensure the running of an information clearing house on disaster situations and threats, with a view to international alerting;
- To issue statements on disaster situations and threats;
- To arbitrate in disputes of national Blue Shield committees;
- To provide expert advice and evidence to the International Criminal Court and other international tribunals in conjunction with national committees as required.

[19] ICA mission: http://www.ica.org/static.php?ptextid=mission&plangue=eng
IFLA mission: http://www.ifla.org/III/intro00.htm
ICOMOS mission: http://www.international.icomos.org/mission_eng.htm
ICOM mission: http://icom.museum/mission.html
CCAAA mission: http://www.ccaaa.org/what.shtml

[20] See http://www.ifla.org/VI/4/pac.htm

cooperation for the preservation of library materials, while ICOMOS has an International Scientific Committee on Risk Preparedness and an annual publication: Heritage @ Risk[21] and ICOM has developed in the last five years two main activities on risk management[22]: the Museums Emergency Programme and the Disaster Relief for Museum initiative.
All NGOs have their specificity, nevertheless their fields of interest and action go across the borders: many museums, archives and libraries collections are kept in historic buildings; museums have libraries and archives in their institutions; archaeological sites have dig storages with collections; monuments and palaces have collections (objects, books, pictures, video…); churches, temples and mosques include sacred objects, manuscripts, documents…; libraries and archives have objects among their collections, and so on.

In December 2008 the Association of the National Committees of the Blue Shield (ANCBS) has been established in The Hague.

[21] See http://www.international.icomos.org/risk/index.html

[22] See http://icom.museum/risk_management.html

II.7. CONSERVATION ASSESSMENT – AN EXAMPLE

Many conservation and preventive conservation assessment methods have been developed in the last ten/fifteen years. Some of them have been proved to be more useful and effective than others, such as: ICCROM's Preventive Conservation Calendar and Preventive Conservation Indicators[23].

The one that I find interesting for my research is "The Conservation Assessment: a Proposed Model for Evaluating Museum Environmental Management Needs" developed by a group of interdisciplinary specialists, among them: Erica Avrami, Kathleen Dardes and Marta de la Torre of the GCI in 1998. The peculiarity of this conservation assessment is that already in 1998 the disaster risk management component was present and higly considered.

II.7.A. Objectives and Methodology

An essential first step in the establishment of an environmental management strategy for a museum is an assessment of the various factors that may affect the preservation and care of the collections. Such an assessment should focus on the museum environment in its broadest sense, taking into account both the physical and the organisational aspects of a museum. The physical environment is the actual set of conditions in which collections are housed, exhibited and used. The organisational environment includes a museum's mission, functions, resources, and institutional activities. Both these environments are to a large extent inter-dependent and play a role in the preservation of museum collections.

The guidelines for undertaking a conservation assessment of a museum collection and its building reflect a broad view of the museum environment and encompass an analysis of both management and technical issues. The aim of this approach is the development of appropriate and sustainable solutions to environmentally-induced problems affecting collections. Sustainability of proposed solutions for improving the environment of collections will be highly dependent on good management practices that take into account the museum's collection,

[23] McCord, Margaret, and Antomarchi, Catherine. *A Preventive Conservation Calendar for the Smaller Museum.* Rome, International Centre for the Preservation and Restoration of Cultural Property, 1997.
Menegazzi, Cristina and Putt, Neal. *ICCROM Preventive Conservation Indicators*. Rome, International Centre for the Preservation and Restoration of Cultural Property, 1998.

building, and organizational policies and activities.

Nowadays, environmental issues related to climate change, pollution reduction and ecology start to be considered in the decisions taken in museum and cultural heritage management field (Cassar 2005).

The methodology proposed here for a conservation assessment has evolved from several earlier models and prior experience in carrying out assessments of museum collections. The GCI first developed an assessment strategy, intended for museums in the United States, in collaboration with the National Institute for Conservation (NIC). This project resulted in a set of guidelines entitled "The Conservation Assessment: A Tool for Planning, Implementing, and Fundraising" which was published in 1990. Since then, the GCI has been developing refinements to the assessment process. The underlying philosophy of the revised GCI assessment methodology is a more thorough integration of building, collection, and organisational issues

In 1998, for the GCI the principal objective of a conservation assessment was to assist a museum to: assess its environmental needs; identify and prioritise problem situations; establish appropriate maintenance and management regimes and to implement sustainable and appropriate technical solutions, where necessary.

The "risk component" appears when describing what a museum may experience:

> "… Museum collections may experience deterioration through a number of environmentally- induced risks which often co-exist in complex interrelationships. Contributing to these inter-relationships are: the inherent sensitivity of collections due to material, fabrication, or condition; climate, both regional and local; response of the building and systems (if any) to the climate, policies and procedures for the management of the collection and the building, natural disasters and human threats…[24]"

These guidelines for a conservation assessment reflect a recognition of this complex interrelationship of factors. In this sense, the assessment attempts to characterise: collections sensitivities, building performance, risks from the environment and use of the collection and building and risks from policies and practices relating to management, operations, or visitation.

[24] *The Conservation Assessment: a Proposed Model for Evaluating Museum Environmental Management Needs*, GCI, Los Angeles, 1998.

The effects of environmental factors and threats such as natural and man-made disasters on museum collections are a function of the vulnerability or sensitivity of the collections, the history of exposure to these factors and threats, and institutional policies and practices for use and management of the collections. Identifying collection sensitivities and understanding their importance is crucial to forming a strategy for environmental management. Understanding the inherent performance of the building in protecting the contents from the detrimental effects of the environment is essential to identifying possible modifications or operational measures that may improve performance.

The collections form the basis of the museum; there is therefore little opportunity to effect risk reduction through changes to the collections inventory. Likewise, the climate in which a museum is situated also cannot be changed. Building response to climate and to natural disasters and other threats is a function of building location, configuration, construction details, materials and assemblies, history of maintenance and use of spaces. Building performance can be modified through alterations or manipulated through operations. Building performance may also be compensated for through interior environmental control systems which sustain a desired interior environment. Strategies for dealing with building performance will, however, need to be adapted to the nature of the building which may limit the options available. This would be particularly true in the case of historic buildings.

Institutional philosophies, policies and procedures, especially those pertaining to use and exhibition of the collections, also affect collections risk. These institutional factors may increase or reduce collections risk as the institution balances the need to allow access to its collection (through exhibitions, loans, research) and the need to assure the optimum conditions for the conservation of the collection. Because of the multi-faceted nature of a museum, the methodology for a conservation assessment as presented here reflects a strategic approach to environmental management. It encompasses a wide range of conservation issues affecting both the museum's collection and building, and considers the institutional mission, functions, activities, and resources. This methodology will help to establish patterns and relationships that exist amongst the institution's organization, its collections, site and structure, and internal and external environmental conditions.

The long and seasoned experience of GCI has shown that successful conservation assessments

involve technical evaluations and critical judgments that go beyond the observation and documentation of the conditions manifested by the building or collections. Architectural and collections assessors rely on education, experience, skills, inquiry, deductive reasoning, collaboration and qualitative analysis to arrive at recommended strategies for environmental management. As might be expected, the analytical processes are highly individualistic and may even vary for the same professional when assessing different museums.

The process by which conditions, causative factors and risks are analysed, characterised and prioritised is the key point of a successful assessment. This process of problem definition is followed by the evaluation of existing conservation management strategies in place at the museum and the possible recommendation of new ones to augment or replace them where appropriate. This evaluation, along with the development of new strategies, should be undertaken collaboratively by the collection and building assessors, and should be within the realm of practical implementation by the institution. Consultation with museum staff is necessary to allow the assessors to recommend actions that are both appropriate and sustainable within the particular institutional context. The analysis and recommended strategies that result from an assessment should serve as the basis for a conservation plan for the collection that takes into account the requirements of both the collection as well as its building.

Following the same line developed by ICCROM in 1995 with its programme "Teamwork for Preventive Conservation" and its "indicators"; and anticipating the training course TIEM (Teamwork for Integrated Emergency Management) established with ICOM and ICCROM in 2005, GCI enphasises the role of a multidisciplinary team:

> "… The assessment team
> The conservation assessment is designed to be undertaken by a team of people which should include: a collections conservator (who may or may not be a member of the museum's own staff); an architect and museum staff whose jobs either directly involve care of the collection or the building (conservation, curatorial, building manager); or whose jobs may affect these areas indirectly (i.e., security, cleaning staff)…[25]"

[25] See previous foot note.

For GCI, the primary responsibility for the gathering and analysis of information required in an assessment will fall to the collections conservator and the architect. These two assessors will be responsible for liaising with other museum staff throughout the assessment process. These two assessors will also have primary responsibility for proposing environmental management strategies for the institution, in consultation with museum staff. In some cases, the assessment may point to problems that will require the advice of other experts - for example, structural, electrical, or mechanical engineers, pest control specialist, or other consultants who can provide more in-depth analysis and advice on particular problems.

GCI recommends four phases in a conservation assessment.

The First Phase: Preparation: information-gathering prior to the assessment.
As part of its preparation for a conservation assessment, a museum will need to gather information in a number of different areas in order to supply the collection and architectural assessors with sufficient background on the institution's mission, building, collection, staffing and activities. The museum staff indicates if there are any particular problems they would like to see the museum address, what its institutional priorities are, and its expectations for the assessment.

The Second Phase: Information-gathering during the assessment: on-site observations and interviews. During this phase of the assessment, the collection assessor and the architectural assessor each undertake an examination of the various aspects of the museum environment within their respective areas of expertise. This is usually accomplished by a walk-through of the museum by each of the assessors, accompanied by relevant members of the museum staff. During this initial phase of the assessment, the two assessors may chose to work independently, in order to gain as much information as possible about the collection and the building. Through observations of existing conditions, collection and review of additional documentation on the building, the collection and the environment, along with interviews with museum staff regarding the policies and procedures within the museum, the assessors is able to gather sufficient data on which to base a subsequent analysis of areas of present and potential risk to the building and to its collection.

The Guidelines in annex presented below offer a series of questions organised into the following categories: 1) The Macro-environment, 2) The Building: Performance

Characterisation, and 3) The Collection Environment. The data gathered in response to these questions-- whether obtained through interviews, existing documentation, or observations-- form the basis for an analysis and diagnosis of problems, their causes and significance.

At the end of the initial walk-through and set of interviews, each assessor gains enough information to be able to identify present and/or potential problem areas within his/her field of expertise. At this point, the two assessors compare their data and analyses, identifying overlapping areas of concern, particularly where problems with the building and its management may be affecting the environment of the collection. They identify the most serious areas of threat for the collection from all sources, and plan to review these together in the next phase of the assessment.

The Third Phase: Collaborative analysis and strategies.

Having identified key areas for further investigation or analysis, the collection and architectural assessors review these areas together; diagnose probable causes of current or potential problem areas; establish possible inter-relationships among problems affecting the collection, building, and organisation; and propose strategies for addressing them that are appropriate for the institution.

At this point, the assessor is able to address three basic questions regarding the collection:

- to what types of risks is the collection likely to be vulnerable both now and in the future?
- what environmental conditions and factors contribute to this deterioration (ie. excessive moisture, light, etc)?
- what causes these conditions? (lack of building maintenance, leaks in pipes, unscreened windows)?

As part of this analysis, the assessors will review existing strategies for environmental management in the museum. They will also develop, where necessary, new strategies to strengthen or replace existing approaches, where the latter are insufficient in providing safe environmental conditions.

This phase results in: 1) the identification of broad strategies for environmental management that address the specific needs of the collection within the limitations of the climate, building, and institutional resources. This includes recommending possible changes in the institution's

policies and practices where such changes are likely to reduce risk to the collection and in 2) the development of prioritised implementation plans for improvements in building performance to ameliorate environmental conditions and threats. These plans are tailored to the specific conditions of the institution, its building, collections, and climate and context.

The Fourth Phase: Preparation of the assessment report.

The report that results from the GCI conservation assessment contains three principal sections: 1) data and analyses, 2) recommended strategies, 3) proposed phases for implementation. The collection and architectural assessors should collaborate in the preparation of a single report, taking care that recommendations for the collection and the building are mutually compatible.

In a Preventive Conservation Assesment undertaken by myself in 1995 at the Picasso Museum in Paris, I was able to present to the Directoty Bodies the possible solutions in oder to minimise the impact of the problems/risks. The solutions were organised and presented following time and cost priorities.

II.7.B. Guidelines

In the preparation for a conservation assessment, it is essential that the assessors have as much background information on the museum, the climate in which it is located, its buildings and collections prior to the assessment visit. By obtaining as much of this information as possible beforehand, the assessors be better prepared for a more comprehensive examination and analysis of potential key areas when on-site.

It is therefore recommended that the following information, whenever they exist, be compiled and submitted to the assessors prior to the assessment: the Institutional background statement; the floor plans and sections for each structure; the information on the site and surroundings (topography, gardens, adjacent traffic areas); the local weather bureau statistics; the local air quality statistics; the collections management policy; the pest management policy; the environmental monitoring data; the loan policies/ contract; the guidelines for handling, storing and exhibiting the collections; the guidelines pertaining to the storage of collections and/or use of storage areas; the guidelines for photographing collections; the lighting specifications for different types of materials; the guidelines for packing or unpacking objects; the guidelines for cleaning or repairing collection materials; the guidelines for labeling objects; the emergency management plan; the guidelines for dealing with vandalism; the copies of period photographs of the building; the building maintenance records; the original building construction documents and the documents reflecting alterations to the structure

In annex, several forms are presented as a support tool during a conservation assessment.

The first step is the analysis of the macro-environment of the museum. At this moment, the data concerning the climate characterisations are collected: temperature, R.H., precipitations, wind and air movement, solar radiations –and I would add, shadows orientation and incombrances-, air quality, particulates, gaseous pollutants, air borne insects, vegetation and landscaping near the building, surrounding constructions, adjacent buildings, pavements, water sources…

The second step concerns the museum building and its characterisations: thermal performance and response, moisture, ventilation and filtrations, natural light, structure, fire resistance and protection and physical security.

The third step deals with the collection environment. Its first part describes the collection use and management including policies in exhibition and storage areas. Its second part presents the sensitivities of the collection to climatic causes of deterioration. A number of questions are listed in order to identify the "chief" risk factor, both present and potential, for the collection. Under the second part of the third step of the conservation assessment forms only RH, temperature, radiation, contaminants and biodeterioration are included.

It is in fact the fourth step that develops the threats to the museum collection and building from natural and man-made emergencies. In the "Institutional Preparedness" chapter of GCI conservation assessment guidelines, the concepts of preservation and response are mentioned, while recovery is not yet indicated. In the "Threat Characterisations" chapter only some agents of deterioration (Michalski 2004) are mentioned: fire; wind, hurracanes and typhones; lightning; flooding; seismic and security. At the end of the list of questions of each deterioration agent, recovery is mentioned. In this case the word "recovery" doesn't intend yet to be the one of the Disaster Risk Management phases as described by Herb Stovel also in 1998[26].

[26] Stovel, Herb. *Risk Preparedness: a Management Manual for World Cultural Heritage*, Rome, ICCROM, 1998, p. 25-28.

II.8. NEW VISION OF PREVENTIVE CONSERVATION VERSUS RISK ANALYSIS

The conventional approach to climate control specifications for museums in the late-twentieth-century has been to find a single target associated with "ideal" conditions and, failing that, to specify "compromise" or "relaxed" conditions. It was assumed that the further one strayed from the ideal target, the greater the damage to the collections. Despite a steady undercurrent of thoughtful critiques from the very beginning of the climate control boom in museums (Rogers 1976) this fundamentalist approach to specifications has proven remarkably persistent.

Much of the success of a simplistic approach has nothing to do with whether or not museums actually believe that ideal control is ideal for collections, but with the fact that a single target makes life much easier for architects, engineers, curators, collection managers, exhibit designers, preparators, and, not least, conservators. I do not mean simply operationally easier in museums where it is achieved but intellectually easier in any museum, whether it is achieved or not.

Many decades have passed since the encouragement of the first magic numbers for climate control in museums—the "60°F, 60% relative humidity (RH) rule" of Rawlins, (Rawlins 1942)—and the last three decades have seen widespread implementation of museum climate control "improvements." An entire generation of conservators and conservation scientists have watched the accumulation (or not) of damage in collections modified (or not) by climate control.

As Michalski describes in a recent article [27]:

> "…Until recently, climate specifications for museums and archives in the *ASHRAE (*American Society of Heating, Refrigerating, and Air-Conditioning Engineers) *Handbook* (the North American engineer's bible) was buried in a chapter on miscellaneous special applications. The advice was simple: provide 21ºC and 50% RH, with minimal fluctuations. In 1996 work began on a separate "Museums, Libraries, and Archives" chapter for the 1999 edition (ASHRAE 1999). A revised edition, incorporating new material on pollution, appeared in 2003 (ASHRAE 2003)".

[27] Michalski, Stefan. *The Ideal Climate, Risk Management, the ASHRAE Chapter, Proofed Fluctuations, and Toward a Full Risk Analysis Model.* Contribution to the Experts' Roundtable on Sustainable Climate Management Strategies, held in April 2007, in Tenerife, Spain.

II.8.A. A Risk Management Approach to Climate Control

In Chapter II.5. Standards and Methods, I recall that what is really important in order to avoid risks provoked by inadequate temperature and R.H., but especially by rapid fluctuations of them, is to consider the "Curriculum vitae" of the collection item, or of the collection itself. The application of "Standards", and even more if they are internationally recognised, reassures the museum curator in his/her tasks and responsibilities. Common sense and experience teach us to approach such dilemmas from the perspective of questioning, rather than seeking ready answers: What can go wrong? Which problem is biggest? How can I reduce it? Risk management formalises this intuitive approach.

The originator of the magic numbers in museum climate control, (Rawlins 1942) admitted in his article an "inability to suggest a minimum temperature at which a building should be maintained." He noted that "many materials accustom themselves fairly well, so long as large . . . variations in RH and temperature are avoided." He concludes, however, by finding "acceptable conditions . . . are 15°C, 60%." (Which incidentally, is easy to remember if it is calculated in Fahrenheit degrees 60°F, 60%) (Michalski 2007). Considerations have to be taken about the respect of available and future resources at disposal.

What is more reasonable: to try to avoid or mitigate the impact of a possible risk caused by inadequate environmental conditions applying "reassuring standards" that, in most of the case, in order to be reached, demand a high waste of energy and as a consequence a "non ecological" approach; or try to have a more "contemporary responsible" approach by looking for a more "cost-ecological effective" solution?

II.8.A.a. Risk and Hazard

A risk can be considered as divided in two parts: the hazard and its impact. When assessing risk, one combines the likelihood or frequency of the hazard with the scale of the impact (also called consequence, loss). Although we tend to associate the word *risk* with individual events, it can be applied to continual and intermittent losses if one specifies some time horizon (such as ten years or one hundred years) for the assessment of whatever has accumulated (Michalski 2007).

II.8.A.b. Museum Climate as Hazard: Incorrect T and Incorrect RH

A means for expressing climate control issues as hazards was developed within Michalski's (1994) schema for nine agents of deterioration, where one finds "incorrect temperature (T)" and "incorrect relative humidity (RH)." Within these, a few subtypes were proposed:

Three types of incorrect T:

1. too high;
2. too low;
3. fluctuations about a mean.

Four types of incorrect RH:

1. damp;
2. above and below a critical value;
3. above 0%;
4. fluctuations about a mean.

These types were not intended as rigorous material science categories but as practical aids for grouping hazards during identification and control.

CHAPTER III

REVIEW OF THEORY AND PRACTICE

III.1. DISASTERS AND VULNERABILITY

This chapter deals with theoretical discussion on disasters and vulnerability. It is organised in two sections. The first section will examine various aspects that contribute towards theoretical understanding of disasters. Their theoretical conception and understanding has undergone a significant shift over last few decades. This is followed by a discussion of various approaches for analysing vulnerability.

Most of the 20th century witnessed a technocratic approach, which was essentially based on objectivist, positivist, determinist and reductionist assumptions of logical empiricism. The application of measuring and monitoring techniques, sophisticated management strategies and engineering structures (e.g. dams, levees) were seen as the only choices humanity had to withstand the vagaries of nature. Scientific effort was spent on the study of environmental triggers, rather than on human actions, with great emphasis placed on geo-tectonics, climatological, or biological "trigger" events arising in nature.

Accordingly, disasters were attributed to natural forces, representing them as a departure from a state of normalcy to which a society returned to on recovery. This denied the wider historical and social dimensions of hazard and focused attention largely on technocratic solutions (Rodríguez, Quarantelli, Dynes 2007) Under this paradigm, disasters were conceived as similar to wars. Gilbert (1998) states that:

> "Catastrophe was imputed to an external agent and human communities were entities that reacted globally against an aggression. Bombs fitted easily with the notion of an external agent, while people harmed by earthquakes bore an extraordinary resemblance to victims of air raids. (p. 11)"

The hazard science and risk field thus drove research in the disaster field for most of the 20th century, building strong alliances with applied scientific disciplines (i.e. engineering). The outcome was concentration of effort in three areas (Jigyasu 2002):
Monitoring and analysis of geophysical processes,

1. Designing, planning and managerial activities to contain the geophysical processes or to modify human behaviour relative to those processes,
2. Developing emergency measures (warning systems, relief).

In the eighties and nineties, seismic research took on a new meaning in the field of social sciences with research on the societal response to various disasters (including earthquake).

According to Susan Cutter (1998; 180):

> "*societal responses* to hazards are related both to perception of the phenomena themselves and to awareness of opportunities to make adjustments. It is unusual for a society to be unaware of the existence of possible hazards in its environment. Yet, the perception and definition of the threat constituted by such hazards may differ markedly between and within societies. A wide range of responses thus characterises the manner in which a society may act to minimize the impact of a hazard".

Local communities are aware of the likelihood of a desasters in their environment even if the hazard occurs rarely and cannot be known by the young generations. Cultural heritage that has suffered a disaster leaves some traces or "scars" to remember us what has happened in the past. As an example we can see on the top of the hill of Antananarivo, Madagascar, what remains of the *Palais de la Reine-Le Rova*, after the fire of 1995 that destroied the interior of the wooden palace, the museum, leaving only the external structure in stone. These remains are visible to everybody arriving and living in Antananarivo as to symbolically remember the vulnerability of cultural property (Fig.18.).

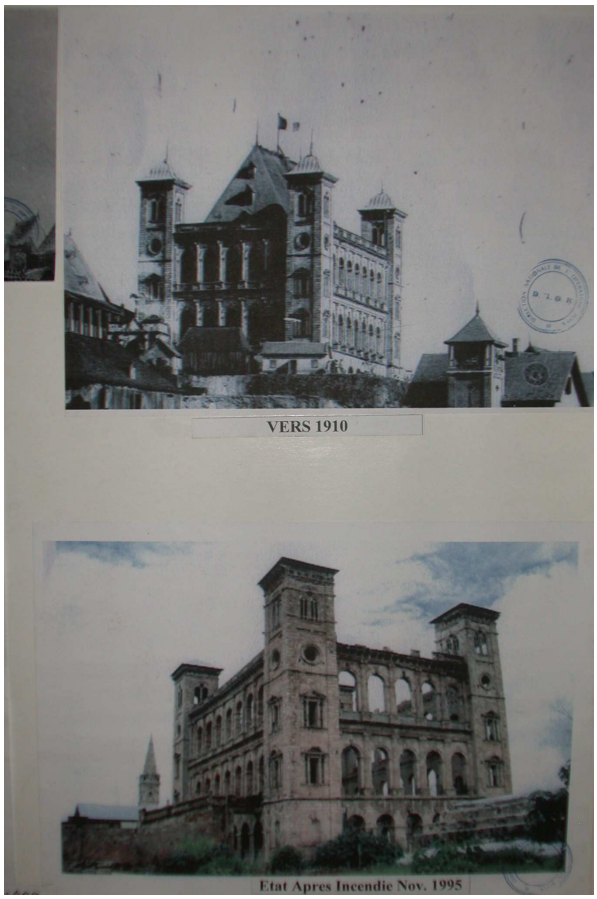


Fig.18. The Palais de la Reine-Le Rova, Antananarivo, Madagascar, before and after the fire of 1995. (© C.Menegazzi)

Another example are the columns of the Temple of Hephaistos in Athens, Greece, that still remain in place and stable even if the scars of several earthquakes are perceivable (Fig.19.).

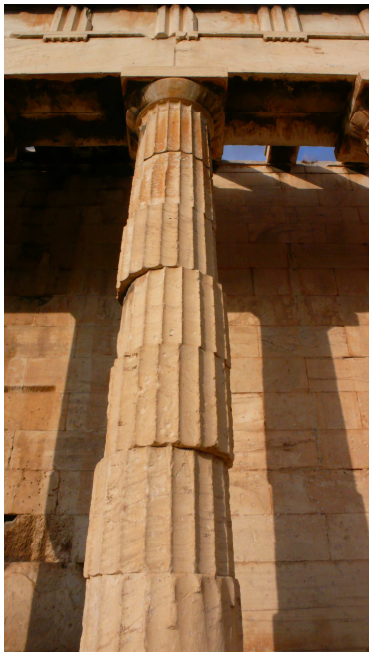


Fig.19. Column of the Temple of Hephaistos in Athens, Greece. (© C.Menegazzi)

The observation that human and material losses from natural hazards increased over the twentieth century without conclusive evidence of a corresponding rise in the frequency of such events, and the same phenomena caused vastly different outcomes both between and even within societies, have drawn attention to the need to view disasters from a wider social and historical perspective (Hewitt 1983).

Accordingly, disaster is defined as an expression of social vulnerabilities (disaster is the result of underlying community logic, of an inward and social process). As such, it cannot be regarded as a discrete event, because by doing so it becomes externalised from the activities and processes that create its context. Moreover, a disaster is not only part of its context, it is in part caused by its context.

Putting it briefly, two main factors that are essential in understanding disasters from a social perspective are: the event effect on people and their environment and the human activities that increase its impact.

Much of the thinking surrounding the relationship between disasters and development has been (and still is) about how post-disaster response can be better made to relate to "development". In the meantime, development has run the risk of being interrupted and impeded (or even negated) by disasters and post disaster responses, but development has been something apart from such inconveniences.

In the literature on disasters and development it is common to find statements to the effect that development can either increase or decrease vulnerability and disaster risk according to the consideration given to risk reduction in the formulation and implementation of development projects.

The relationship between disasters and development is particularly relevant when it comes to the vulnerability that affects the masses of urban and rural poor in the developing world who have little access to the resources, power and choice mechanisms needed to radically change their life circumstances.

Disasters, in the same way as other types of economic or social crises, have a life history. This includes pre-disaster situation in which the structural conditions for disaster are

established, the period of onset, when natural hazard such as earthquake strikes and resulting development of disaster conditions as such, and finally, the subsequent responses of society during what are known as the relief, rehabilitation and reconstruction "phases".

Systems theory in sociology is especially underdeveloped in the area critical to the study of disasters. This is because it has neglected the theoretical placement of human systems in the context of a general ecological field, or active environment, in which human socio-cultural systems can be seen as part of larger natural processes.

From an ecological perspective, then, disasters are primarily processes in which hazardous events represent moments of catharsis along a continuum whose origins lie buried in the past and whose outcomes extend into the future. It is the pre-disaster conditions that mainly affect a society's ability to cope with hazard; it is its reconstruction operations that largely determine the effects of subsequent events.

An integrated ecological approach conceptualises the nature of disasters as total events in such a way that they are thought of as part of a natural process in which human systems and their environment interact, changing in relationship to each other in a kind of evolutionary process. The theoretical perspective needed should also be capable of conceptualising the process by which disasters are produced, developed as events and are eventually absorbed as part of the natural evolutionary process of this planet (Jigyasu 2002).

The above discussion brings out various perspectives on disasters, as an alternative to the traditional "techno-centric" paradigm. Taking all these "alternative" perspectives into consideration, an integrated framework will represent a shift from focussing only on the technical aspects of the physical phenomenon to a wider perception, that natural disasters are predominantly environmental, social and developmental issues. This does not mean that we can deny the significance of technical aspects.

Natural disasters are neither unforeseen nor isolated problems. They are integral parts of the spectrum of man-environment relations. The mass-media communication of the last years, especially of the last twenty years, has transformed and increased the visibility of the catastrophic events. It is true that the climate change and the generalised non-ecologic decision making approach have thrown the nature off balance with the consequence of raising the

numbers of hazard situations in a more fragilised social context. The augmentation of water and mud floods, earth subsidings and failures, tropical storms, rainfall and the raising of the sea level together with wind strengthening, drought and desertification, etc. are largely known. But what is especially known nowadays –that was unknown fifty years ago- is the precise density of the population in a specific point of the globe. During the last decades the rural areas have been abandoned while the cities have increased the number of inhabitants often living with minimal ealth and security conditions and with no access to education and culture opportunities.

The approach attempts to identify "qualities" and "factors" which determine potential damage and characteristics that are relevant for defining the "values" of these "factors". The following factors and phases are considered as relevant with regard to loss reduction:

- Hazard (the physical process itself)
- Exposure (all individuals, infrastructure, cultural heritage, etc. which are exposed to hazard)
- Preparedness/Readiness (all precautionary activities and measures which enable rapid and effective response to hazard events)
- Prevention (all activities and measures in advance of a hazard event designed to reduce hazards and their effects and provide permanent protection from their impacts)
- Response (all activities and measures taken immediately prior to and following a hazard event to reduce impacts)
- Recovery (all activities and measures to recover and reconstruct an area affected by a hazard event)

Within the terminology of current international standards for risk assessment (AS/NZS 4360:2004) they can be divided into stages. These are:

1. Establish the context
2. Identify risks
3. Analyse risks
4. Evaluate risks

Michalski is currently developing risk assessment tools, in partnership with ICCROM and the Netherlands Institute for Cultural Heritage (ICN). He is working with a risk analysis expert, Greg. Paoli, to develop models of collection risk, using "Analytica", a software package widely used in the risk analysis field. "Analytica" deals explicitly with uncertainties in expert

judgments of each variable, through user-selected probability distributions, and it can also model dynamic (feedback) systems.

The main focus over the past years has been in developing an overall risk model that can simply accept expert judgments on various risks, as well as accept predictive submodels when they are available. Such “hybrid models” are becoming common in risk analysis.
Michalski presents the difficulties of Risk Assesment as follow:

> “Even if, as scientists and advisors, we successfully quantify all these issues, my experience to date in risk assessment training has taught me that the uncertainty and the difficulty in these risk assessments do not reside in the material science, difficult and incomplete though it may be. The largest uncertainty resides in estimates of the loss of value: how does mold loss compare to embrittlement and severe yellowing? How does color loss compare to paint flaking? Which loss do you prefer? And which costs more to solve? The list is endless. The problem with taking museums away from the belief in an ideal collection climate and its parent, perfect preservation, is not that it was ever a reality but that it was a great comfort (Michalski 2007)” .

III.2 DISASTER RISK MANAGEMENT APPROACHES AND PRACTICES

III.2.A. Introduction

This chapter will discuss the practical implications of theoretical understanding of disasters on existing pre-disaster and post-disaster practices in disaster risk management, especially in the context of communities in developing countries.

"Disaster Risk Management" has been defined as a continuous and integrated multi-sectoral, multi-disciplinary process of planning, and implementation of measures, aimed at preventing or reducing the risk from disasters, mitigating the severity or consequences of disasters, at being ready and prepared in case of an emergency, rapidly and effectly responding to disasters and developing post disaster recovery and rehabilitation.

III.2.B. Definitions

Definitions in the field of Disaster Risk Management of Cultural Heritage are quite recent. They have taken inspiration from the more developped field of disater risk reduction and disater risk management in global strategies which take into consideration the economic, humanitarian, military, infrastractural and social needs and backgrounds.

Here are presented a selection of the definitions that are more used and appropriate to the cultural heritage field. The terms are based on a broad consideration of different international sources and reflect a need expressed in several international venues, regional discussions and national commentaries[1].

Acceptable risk	The level of loss a society or community considers acceptable given existing social, economic, political, cultural, technical and environmental conditions.
Biological hazard	Processes of organic origin or those conveyed by biological

[1] For a more exhaustive glossary, see: http://www.collectionrisk.info/MCRM/X_Glossary.htm#GlossaryEditors

	vectors, including exposure to pathogenic micro-organisms, toxins and bioactive substances, which may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation. *Examples of biological hazards: outbreaks of epidemic diseases, plant or animal contagion, insect plagues and extensive infestations.*
Capacity	A combination of all the strengths and resources available within a community, society or organization that can reduce the level of risk, or the effects of a disaster. *Capacity may include physical, institutional, social or economic means as well as skilled personal or collective attributes such as leadership and management. Capacity may also be described as capability.*
Capacity building	Efforts aimed to develop human skills or societal infrastructures within a community or organization needed to reduce the level of risk. *In extended understanding, capacity building also includes development of institutional, financial, political and other resources, such as technology at different levels and sectors of the society.*
Climate change	The climate of a place or region is changed if over an extended period (typically decades or longer) there is a statistically significant change in measurements of either the mean state or variability of the climate for that place or region. *Changes in climate may be due to natural processes or to persistent anthropogenic changes in atmosphere or in land use. Note that the definition of climate change used in the United Nations Framework Convention on Climate Change is more*

restricted, as it includes only those changes which are attributable directly or indirectly to human activity.

Coping capacity — The means by which people or organizations use available resources and abilities to face adverse consequences that could lead to a disaster.
In general, this involves managing resources, both in normal times as well as during crises or adverse conditions. The strengthening of coping capacities usually builds resilience to withstand the effects of natural and human-induced hazards.

Counter measures — All measures taken to counter and reduce disaster risk. They most commonly refer to engineering (structural) measures but can also include non-structural measures and tools designed and employed to avoid or limit the adverse impact of natural hazards and related environmental and technological disasters.

Disaster — A serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources.
A disaster is a function of the risk process. It results from the combination of hazards, conditions of vulnerability and insufficient capacity or measures to reduce the potential negative consequences of risk.

Disaster risk management — The systematic process of using administrative decisions, organization, operational skills and capacities to implement policies, strategies and coping capacities of the society and communities to lessen the impacts of natural hazards and related environmental and technological disasters. This comprises all

	forms of activities, including structural and non-structural measures to avoid (prevention) or to limit (mitigation and preparedness) adverse effects of hazards.
Disaster risk reduction (disaster reduction)	The conceptual framework of elements considered with the possibilities to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, within the broad context of sustainable development. *The disaster risk reduction framework is composed of the following fields of action, as described in ISDR's publication 2002 "Living with Risk: a global review of disaster reduction initiatives", page 23:* *Risk awareness and assessment including hazard analysis and vulnerability/capacity analysis;* *Knowledge development including education, training, research and information;* *Public commitment and institutional frameworks, including organisational, policy, legislation and community action;* *Application of measures including environmental management, land-use and urban planning, protection of critical facilities, application of science and technology, partnership and networking, and financial instruments;* *Early warning systems including forecasting, dissemination of warnings, preparedness measures and reaction capacities.*
Early warning	The provision of timely and effective information, through identified institutions, that allows individuals exposed to a hazard to take action to avoid or reduce their risk and prepare for effective response. *Early warning systems include a chain of concerns, namely: understanding and mapping the hazard; monitoring and*

	forecasting impending events; processing and disseminating understandable warnings to political authorities and the population, and undertaking appropriate and timely actions in response to the warnings.
Ecosystem	A complex set of relationships of living organisms functioning as a unit and interacting with their physical environment. *The boundaries of what could be called an ecosystem are somewhat arbitrary, depending on the focus of interest or study. Thus the extent of an ecosystem may range from very small spatial scales to, ultimately, the entire Earth (IPCC, 2001).*
Emergency management	The organization and management of resources and responsibilities for dealing with all aspects of emergencies, in particularly preparedness, response and rehabilitation. *Emergency management involves plans, structures and arrangements established to engage the normal endeavours of government, voluntary and private agencies in a comprehensive and coordinated way to respond to the whole spectrum of emergency needs. This is also known as disaster management.*
Forecast	Definite statement or statistical estimate of the occurrence of a future event (UNESCO, WMO). *This term is used with different meanings in different disciplines.*
Geological hazard	Natural earth processes or phenomena that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation. *Geological hazard includes internal earth processes or tectonic origin, such as earthquakes, geological fault activity, tsunamis, volcanic activity and emissions as well as external processes such as mass movements: landslides, rockslides, rock falls or*

	avalanches, surfaces collapses, expansive soils and debris or mud flows. Geological hazards can be single, sequential or combined in their origin and effects.
Hazard	A potentially damaging physical event, phenomenon or human activity that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation. *Hazards can include latent conditions that may represent future threats and can have different origins: natural (geological, hydrometeorological and biological) or induced by human processes (environmental degradation and technological hazards). Hazards can be single, sequential or combined in their origin and effects. Each hazard is characterised by its location, intensity, frequency and probability.*
Hazard analysis	Identification, studies and monitoring of any hazard to determine its potential, origin, characteristics and behaviour.
Hydrometeorological hazards	Natural processes or phenomena of atmospheric, hydrological or oceanographic nature, which may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation. *Hydrometeorological hazards include: floods, debris and mud floods; tropical cyclones, storm surges, thunder/hailstorms, rain and wind storms, blizzards and other severe storms; drought, desertification, wildland fires, temperature extremes, sand or dust storms; permafrost and snow or ice avalanches. Hydrometeorological hazards can be single, sequential or combined in their origin and effects.*
Land-use planning	Branch of physical and socio-economic planning that determines

	the means and assesses the values or limitations of various options in which land is to be utilized, with the corresponding effects on different segments of the population or interests of a community taken into account in resulting decisions. *Land-use planning involves studies and mapping, analysis of environmental and hazard data, formulation of alternative land-use decisions and design of a long-range plan for different geographical and administrative scales.* *Land-use planning can help to mitigate disasters and reduce risks by discouraging high-density settlements and construction of key installations in hazard-prone areas, control of population density and expansion, and in the siting of service routes for transport, power, water, sewage and other critical facilities.*
Mitigation	Structural and non-structural measures undertaken to limit the adverse impact of natural hazards, environmental degradation and technological hazards.
Natural hazards	Natural processes or phenomena occurring in the biosphere that may constitute a damaging event. *Natural hazards can be classified by origin namely: geological, hydrometeorological or biological. Hazardous events can vary in magnitude or intensity, frequency, duration, area of extent, speed of onset, spatial dispersion and temporal spacing.*
Preparedness	Activities and measures taken in advance to ensure effective response to the impact of hazards, including the issuance of timely and effective early warnings and the temporary evacuation of people and property from threatened locations.
Prevention	Activities to provide outright avoidance of the adverse impact of

	hazards and means to minimize related environmental, technological and biological disasters. *Depending on social and technical feasibility and cost/benefit considerations, investing in preventive measures is justified in areas frequently affected by disasters. In the context of public awareness and education, related to disaster risk reduction changing attitudes and behaviour contribute to promoting a "culture of prevention".*
Public awareness	The processes of informing the general population, increasing levels of consciousness about risks and how people can act to reduce their exposure to hazards. This is particularly important for public officials in fulfilling their responsibilities to save lives and property in the event of a disaster. *Public awareness activities foster changes in behaviour leading towards a culture of risk reduction. This involves public information, dissemination, education, radio or television broadcasts, use of printed media, as well as, the establishment of information centres and networks and community and participation actions.*
Public information	Information, facts and knowledge provided or learned as a result of research or study, available to be disseminated to the public.
Readyness	The state of being ready to face and cope with an hazard when it strikes. In the Disaster Risk Management cycle this phase is located just before the response. It means that mitigation measures have been taken in advance in order to reduce the impact of the disaster. Logistic, management, tools, networks, financial and human resources... are available to intervene in case of catastrophe.

Recovery	Decisions and actions taken after a disaster with a view to restoring or improving the pre-disaster living conditions of the stricken community, while encouraging and facilitating necessary adjustments to reduce disaster risk. *Recovery (rehabilitation and reconstruction) affords an opportunity to develop and apply disaster risk reduction measures.*
Relief / response	The provision of assistance or intervention during or immediately after a disaster to meet the life preservation and basic subsistence needs of those people affected. It can be of an immediate, short-term, or protracted duration.
Resilience / resilient	The capacity of a system, community or society potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure. This is determined by the degree to which the social system is capable of organizing itself to increase its capacity for learning from past disasters for better future protection and to improve risk reduction measures.
Retrofitting (or upgrading)	Reinforcement of structures to become more resistant and resilient to the forces of natural hazards. *Retrofitting involves consideration of changes in the mass, stiffness, damping, load path and ductility of materials, as well as radical changes such as the introduction of energy absorbing dampers and base isolation systems. Examples of retrofitting includes the consideration of wind loading to strengthen and minimize the wind force, or in earthquake prone areas, the strengthening of structures.*
Risk	The probability of harmful consequences, or expected losses

	(deaths, injuries, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between natural or human-induced hazards and vulnerable conditions. *Conventionally risk is expressed by the notation Risk = Hazards x Vulnerability. Some disciplines also include the concept of exposure to refer particularly to the physical aspects of vulnerability.* *Beyond expressing a possibility of physical harm, it is crucial to recognize that risks are inherent or can be created or exist within social systems. It is important to consider the social contexts in which risks occur and that people therefore do not necessarily share the same perceptions of risk and their underlying causes.*
Risk assessment/analysis	A methodology to determine the nature and extent of risk by analysing potential hazards and evaluating existing conditions of vulnerability that could pose a potential threat or harm to people, property, livelihoods and the environment on which they depend. *The process of conducting a risk assessment is based on a review of both the technical features of hazards such as their location, intensity, frequency and probability; and also the analysis of the physical, social, economic and environmental dimensions of vulnerability and exposure, while taking particular account of the coping capabilities pertinent to the risk scenarios.*
Structural / non-structural measures	Structural measures refer to any physical construction to reduce or avoid possible impacts of hazards, which include engineering measures and construction of hazard-resistant and protective structures and infrastructure. *Non-structural measures refer to policies, awareness, knowledge development, public commitment, and methods and operating practices, including participatory mechanisms and the provision of information, which can reduce risk and related impacts.*

Sustainable development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: the concept of "needs", in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and the future needs. (Brundtland Commission, 1987). *Sustainable development is based on socio-cultural development, political stability and decorum, economic growth and ecosystem protection, which all relate to disaster risk reduction.*
Technological hazards	Danger originating from technological or industrial accidents, dangerous procedures, infrastructure failures or certain human activities, which may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation. *Some examples: industrial pollution, nuclear activities and radioactivity, toxic wastes, dam failures; transport, industrial or technological accidents (explosions, fires, spills).*
Vulnerability	The conditions determined by physical, social, economic, and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards. *For positive factors, which increase the ability of people to cope with hazards, see definition of capacity.*
Wildland fire	Any fire occurring in vegetation areas regardless of ignition sources, damages or benefits.

III.2.C. Pre - Disaster Risk Management Practices

Each different type of hazard requires specific attentions in the way of assessing the possible risk, in the peculiar mitigation measures to put in place, in the response and recovery actions to be employed, etc. As for the vastness of the research field, my investigation considers principally the methods and the actions developed in the pre-disaster situation. In the sub-chapters following III.2.C. earthquake has been choosen as an example of hazard to be analysed deeper.

The key terms that describe the pre-disaster risk management practices are "preparedness" and "mitigation".

"Disaster Preparedness" includes those measures which are aimed at impeding the occurrences of disasters and / or preventing such occurrences and its harmful effects. According to the Disaster Management Manual of UNDP, these include measures that ensure the readiness and ability of a society to

(a) forecast and take precautionary measures in advance of an imminent threat (in case where advance warnings are possible), and
(b) respond to and cope with the effects of a disaster by organizing and delivering timely and effective rescue, relief and other appropriate post-disaster assistance.

Red Cross has recognised disaster preparedness as an effective link between emergency response, rehabilitation and development programmes.

"Mitigation" in relation to a disaster means measures aimed at reducing the impact or effects of a disaster. The UNDP manual defines it as a collective term used to encompass all activities undertaken in anticipation of the occurrence of a potentially disastrous event, including preparedness and long-term risk reduction measures.

III.2.C.a. Building and Planning Regulations and Guidelines

As far as the immovable heritage and the "building container" of the movable heritage- such as museums, libraries, archives, temples, mosques, etc- is concerned the essential components of pre-disaster risk management practices are building and planning regulations, guidelines for new constructions and restoration/rehabilitation of old buildings incorporating earthquake and

other hazards mitigation features and various technical measures of strengthening of existing buildings.

The planning regulations specify zoning regulations to prevent construction on unsafe lands. It also specifies controls for future development, so that communities can be prevented from the disasters. For example, open spaces can be secured for easy escape after an earthquake strikes.

The new constructions in rural areas are classified as "non-engineered" by various technical manuals. According to guidelines for earthquake resistant non-engineered construction[2],

> "The non-engineered buildings are those which are spontaneously and informally constructed in various countries in the traditional manner without any or little intervention by qualified architects and engineers in their design".

This implies that these structures are not technically designed. This definition categorises rural buildings according to uniform technology standards and thus considers them weak and inferior to modern buildings. It is also claimed that most losses of lives during earthquakes have occurred due to the collapse of these structures. These statements negate the probability of "traditional building knowledge" that may be embodied in these structures. Moreover, classifying all of them into one category overlooks the diversity in the nature and quality of construction within them. It does not take into consideration the probability that the existing status of the building in terms of its maintenance status, the age, additions and alterations done over periods may determine the extent of damage suffered, to a large extent. While such regulations and guidelines abound, their feasibility in rural areas is always in doubt.

III.2.C.b. Building Criteria for Earthquake Mitigation[3]

The recent earthquakes in the Abruzzi region in 2009 and in Haiti in 2010 can give us a lesson to understand why certain buildings have resisted to the earth movements while others have collapsed. As an example that can be retrieved in various region of the world,

[2] Published by the International Association for Earthquake Engineering, October 1986, revised edition of "Basic Concepts of Seismic Codes", Vol. I, Part 2, 1980.

[3] These considerations are based on presentations in various conferences of the architect Rohit Jigyasu.

there are various definitions of what criteria should classify buildings as earthquake-safe. However, all of them consider that the safety aims would be met, if a building is designed and constructed in such a way that even in the event of the probable maximum earthquake intensity in the region:

- An ordinary building should not suffer total or partial collapse;
- It should not suffer such irreparable damage which would require demolishing and rebuilding;
- It may sustain such damage which could be repaired quickly and the building put back to its usual functioning.

However some of the most desirable qualities are symmetry and regularity of building form, solid foundation base and reinforcement to improve ductility. Also, there are basically two types of structural framing, which can withstand gravity and seismic load viz. Bearing wall construction and framed construction.
The framed construction may again consist of:

- Light framing members which must have diagonal bracing such as wood frames
- Substantial rigid jointed beams and columns capable of resisting the lateral loads by themselves.

The above-mentioned structural safety criteria can be achieved by adopting appropriate design and construction details involving only small extra expenditure, which should be within the economic means of people in most countries. However, economic affordability is not the only criteria. One also needs to consider "repairable" in its wider scope, taking into account the fact that it is the owners / builders of these houses themselves, who can make decisions with respect to demolition, rebuilding etc.

Of course, there are other factors such as the maintenance status, previous repairs, additions and alterations carried out etc. The above-mentioned basic technical aspects are crucial for determining earthquake mitigation qualities of existing built fabric. Tremendous wealth of the state of the art knowledge exists in design, construction

techniques, geological and geo-technical aspects that contribute to make buildings earthquake safe.

III.2.C.c. Seismic Susceptibility Survey for Museum Collections

Seismic susceptibility surveys for museum collections are an example of preparedness activity. The simple survey method developped by Jerry Podany (2001), Head of the Department of Antiquities Conservation, J. Paul Getty Museum, is presented here. This method has been regularly used in California and in Turkey.

Once the threat of an earthquake is realised it is paramount that action be taken before the event to minimise damage when the earthquake happens. Planning ahead and minimising the collection's susceptibility to earthquake damage is one of the most effective tools man has against seismic activity. The process starts with a survey of the susceptibility of the collections, both in storage and on display. It is common to want to "start doing things to protect the collection" right away and to see the process of a survey as a "waste of time". In reality, the survey is the first and most vital action it can been undertaken. The survey process reveals the extent of susceptibility; it helps to plan for the resources that are needed; and uncovers hidden problems it may not be seen in the beginning. The survey provides detailed information and a view of the "bigger picture" regarding the collections needs.

The first step in conducting a "seismic susceptibility survey" is simply to look around at the building or buildings which house the collection and at the collections themselves (both on exhibition and in storage). The assistance from a structural engineer regarding both the structural integrity of the building and of the elements of the building (such as added gallery dividers, decorative elements, furniture and fixture) is requested. The "surveyer/s" will have to take note of how the objects are displayed, what their shape is, and what type of structural design guided the construction of the cases, supports or pedestals associated with the objects. The latter might include the condition as well as the basic stability of the pedestals, cases or shelves (Fig.20.).

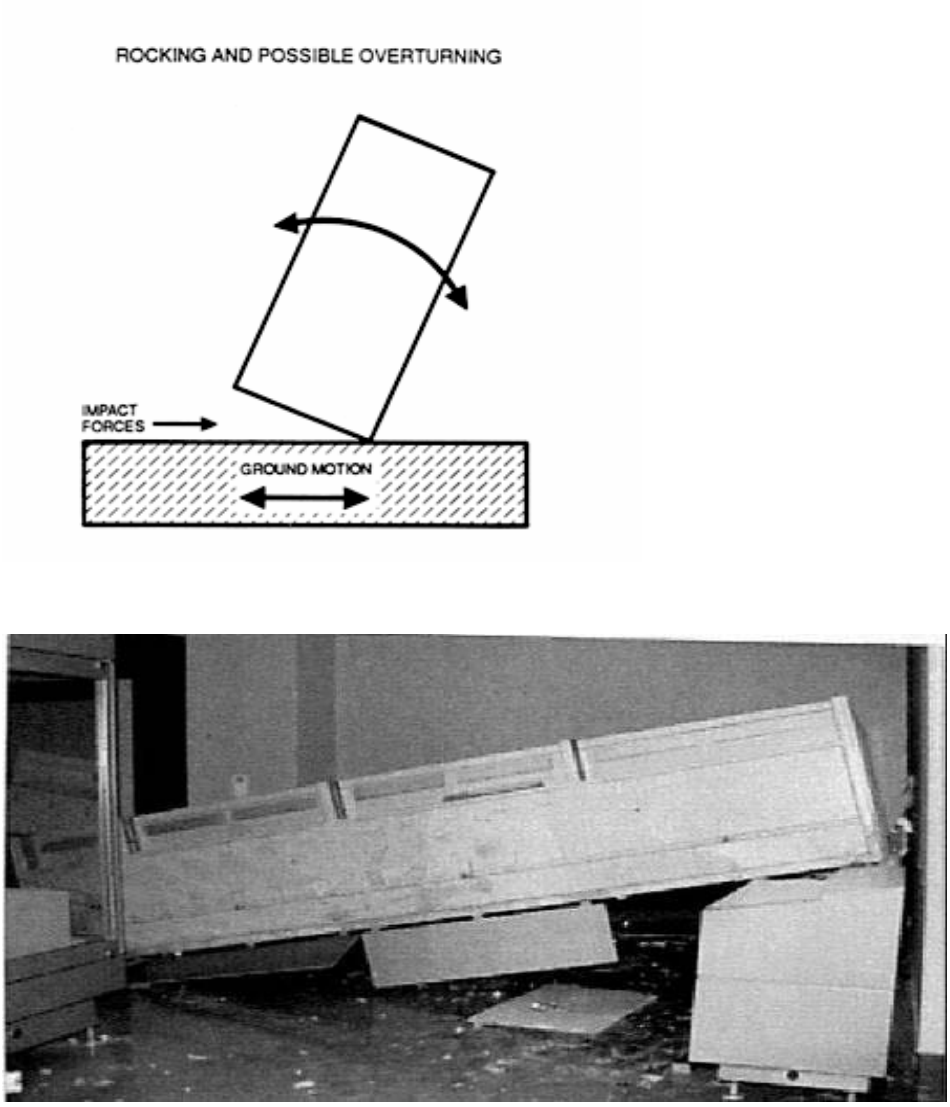


Fig.20. Possible movement during an earthquake of a standing object. (J.Podany)

In the process of conducting a survey it is important to remember that the task will at first seem overwhelming. Priorities should be established as well as developd a clear understanding to what resources it will be needed to meet those priorities and eventually work through the entire collection.

III.2.C.c.1 Seismic Review of the Building (envelope/container) and the Collection (contents)

Essentially a seismic review is the evaluation and categorisation of the susceptibility of the collections to an earthquake and the resistance to seismic damage of the building that houses the collections.

To begin this review it is helpful to view the building as the "envelope" and the collection (as well as exhibition furniture and other material) as "contents". Knowing the susceptibility of both is essential to a good mitigation plan since the envelope can either protect or threaten the contents and with proper precautions the contents can be safely confined within the envelope.

The Building (envelop)

Generally speaking the envelope is the entire building. However it is also important to consider the building as a series of secondary envelopes, galleries and store rooms for example, or floors or sections of the building which have specific characteristics different from other sections, floors, or rooms. It is essential to get professional input in the evaluation of the envelope.

Structural engineers and seismic engineers are invaluable and necessary for a good review of the building's structure and foundation. In most cases building are evaluated for their ability to remain standing or to resist major structural damage during an earthquake. This is based upon an appropriate concern for the safety of people in and around the building. But a building, which is housing irreplaceable works of art and culture, must be considered as a unique case and go beyond these criteria. A wall may significantly crack but not collapse, thus not present an immediate threat to anyone's life. But if a mosaic or fresco was attached to or built into that wall, significant irreversible damage may occur to a priceless work of heritage.

The Collections (content)

Objects become damaged during an earthquake in several ways:

- They tip and fall over or fall from a support shelf or pedestal. The impact of the fall is normally the cause of damage (Fig.21.).
- They move and collide with another object, fixture or wall.
- They shake violently and this shaking causes damage to their structure or surface.
- Other object(s), fixtures or furniture fall onto them (Fig.22.). For example lighting fixtures from ceilings, shelves within a case, or lighting grates in the top of cases, can come loose and fall upon the objects on exhibition or in storage.

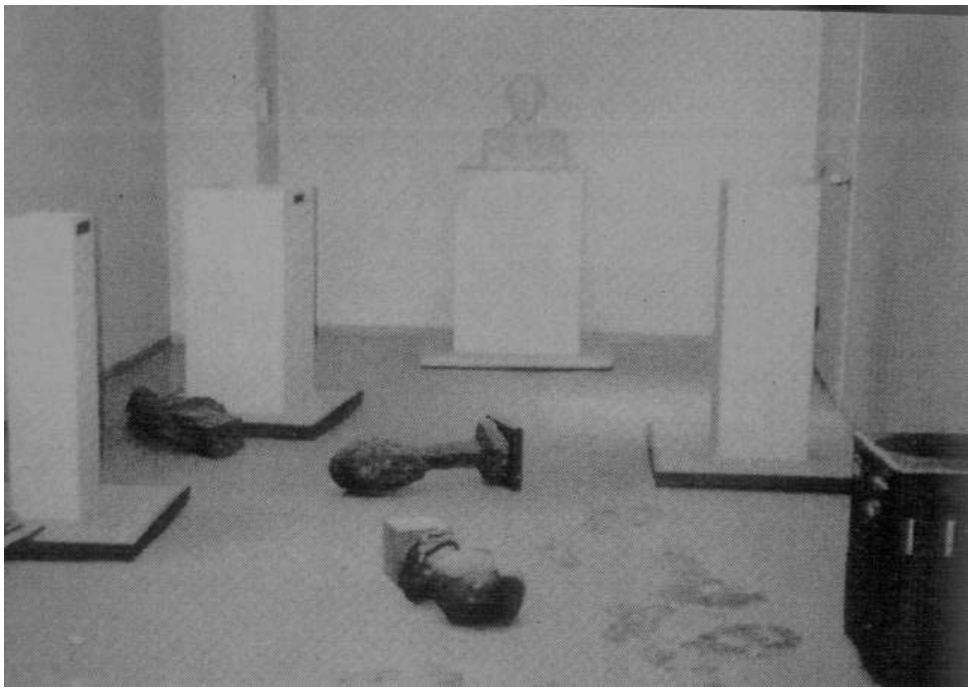


Fig.21. Objects fall from a support shelf or pedestal. (© J.Podany)

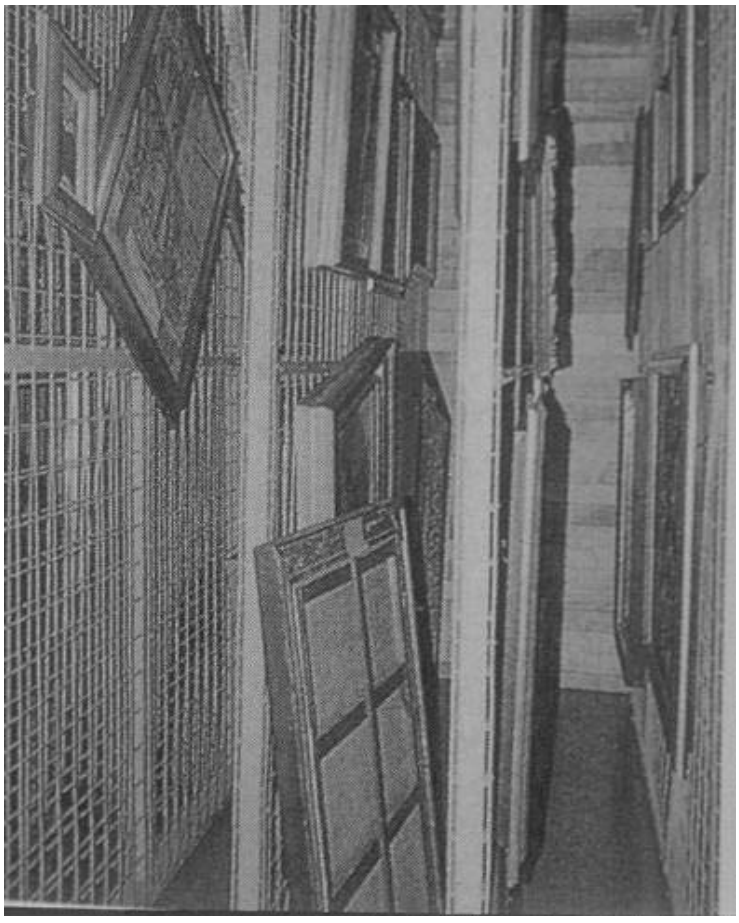
Fig.22. Fixtures and furniture fall onto objects . (© J.Podany)

Although not a repetitive shaking motion, the initial force of an earthquake may suddenly reverse or accelerate. The initial jolt of an earthquake will bring the mass of an object from a still position to sudden acceleration creating significant stresses in the object's structure. The top of the object may accelerate or change directions more slowly than the lower part. If the movement is suddenly stopped or reversed, the top my want to keep going in the initial direction while the bottom, if attached to the ground, may stop or reverse directions more suddenly. By doing a collection survey first it should be looked at the collections and divided them between at least[4] these two categories:

1. Exhibition (Figs.23.a. and 23.b.)
2. Storage (Figs.24.a. and 24.b.)

[4] Collection items can be found also in some offices or in the conservation workshops. If this is the case, it should be taken into consideration.

Figs.23.a. and 23.b. Object non secured in a showcase and in exhibition area. (© J.Podany)



Figs.24.a. and 24.b. Objects non secured in a storage area affected by an earthquake. (© J.Podany)

The effort to seismically protect a collection through mount making and other mitigation efforts will require information about:

1. the types of objects in the collection;
2. the specific needs of the objects;
3. the primary and secondary threats to the collection.

The second phase of the survey involves categorising the exhibition or storage furniture and fixtures as well as the galleries or rooms in which the collections are housed. An evaluation of the fixtures and furniture should take into consideration their condition, stability, resistance to earthquake motion, and potential to become a threat to the collections during an earthquake. Fixtures and furniture include, but are not limited to: pedestals, cases, shelves, lighting fixtures, temporary walls, windows, doors and floors.

Object on E*xhibition*

Objects on exhibition can be divided in the following categories:

1. Free standing: objects that stand alone on the floor without support such as sculpture, large vases, etc There are several major categories:
    - Standing
    - Lying
    - Anchored (Figs.25.a. and 25.b.)

Figs.25.a. and 25.b. Vases anchored to the wall. Private Collection Istanbul. (© C.Menegazzi)

2. Free standing on pedestal or shelf: objects which stand alone without support on a raised pedestal, platform or shelf. Again they fall into several categories:
    - Standing
    - Lying
    - Anchored

3. Groups of objects or single objects within cases. These can fall into a number of categories:
    - Standing
    - Lying
    - Hanging
    - Suspended
    - Anchored

4. Wall mounted objects: such as relief sculptures which are hung vertically on a wall or wall like partition. Some will be fully suspended while others will have additional side or bottom supports.

5. Wall /floor mounted objects: objects which may be partially attached to the wall but also rest or are attached to the floor (Fig.26.).

Fig.26. Pedestal and object attached to the floor. Private Collection, Istanbul. (© C.Menegazzi)

6. Hanging or suspended objects (Fif.27.): such as decorative lamps, chandeliers or other suspended object hanging (pendulum like) without additional supports or restraints.

Fig.27. Different kind of hooks to hang objects. (© C.Menegazzi)

In all of these categories it is important to note certain characteristics of the object and to check:

- if the object is monolithic or assembled from a number of parts
- if those parts are securely assembled or loosely fit together
- the volume (the incumbrance too) of the object, its shape (the bottom flat, round or uneven, round and likely to role
- the size of the foot print of the object with respect to the largest diameter or width (the foot print is the area on which the object is supported, the area touching the ground on which the object stands. The larger the foot print in relationship to the objects overall height the more stable it is).
- the object's height to base ratio. Taller than it is wide or wider than it is tall. The ratio of B:H which is 2:1 is more stable than A B:H of 1:2 for example. More practically put and obvious however is that if an object is very tall and has a very small foot print (base) then it is easily toppled. As that foot print (base) widens the object becomes more stable (Podany, 2001).
- the concentration of weight or its distribution. The lower the weight is concentrated the more stable the object is. The higher it is concentrated the more unstable the object is.

- any eccentric elements that might cause the object to be unstable. Like an outstretched element , an arm for example.

Exhibition furniture and fixtures

Although cases and pedestals support and contain objects they should be evaluated separately, in the same manner as one would evaluate the objects on exhibition. After all, a fully appropriate mount would do no good if a case, pedestal or shelf holding the object collapsed or tipped over in an earthquake. Pedestals, cases, shelves, brackets and other types of exhibition furniture and the objects that sit on or in them can be categorized as follows:

1. Free standing cases, or pedestals.
2. Wall shelves or brackets: objects which are attached or sit upon a shelf or bracket.
3. Wall cases: objects or groups of objects which are contained in a exhibition case which is mounted to the wall.
4. Built in wall case.
5. Hanging cases.

Further categorisation of the exhibition furniture should include:

1. Structure
2. Material (glass, plastic, wood, steel, combination)
3. Anchoring (is it attached? Where and how?) (Fig.28.)
4. Height to width ratio
5. Center of gravity

Fig.28.Object anchored by monophylament (© C.Menegazzi)

Objects in Storage

It is common to basically ignore objects that are in storage and yet in many museums the majority of the collection holdings are in storage. Additionally storage areas are normally less protected; more difficult to get to after an earthquake; and hold the greatest number of secondary threats. Paramount to protecting a collection is the survey of the material in storage.

It has to be checked:

- how the object is positioned in storage:vertical, horizontal, inclined, hanging, etc.
- where is the object: shelf (with or without lip guard), high or low, drawer, crated or boxed, on the floor, on a table, etc.
- if it is somehow protected or restrained from movement; if yes how is it protected or restrained: tied down, padded, held in a conformal support, etc.

Object Conservation Assessment

It has be evaluated if the object is:

- Fragile: the object is structurally weak or highly fragile.
- Susceptible: it has a number of eccentric parts or surface decoration that are fragile
- Unstable: it has top heavy or weak support or the presence of stresses due to the form.
- Multiple construction techniques
- Composed by various materials

And what the conditions are:

- it retains its natural material strength
- it is an assembled object, are the joints intact and strong
- it has been restored and are those restorations stable
- there are structural or surface fractures, cracks or flaws
- the surface is robust or it is fragile

And how is its seismic stability:

- its form is unstable (small foot and large heavy top)
- it will tip or slide, walk or wobble (overturning force)
- how much transmitted force from an earthquake it can withstand
- if any part of the object is weaker than another

Evaluating the seismic stability of an object involves determining the height to base ratio, the center of gravity of the object, or object/case, object/pedestal assembly, and the coefficient of friction between the object, case or pedestal and the floor.

In doing a survey, in order to determine the possible magnifiyng factors that could increase the impact of the possible hazards, the characteristics of the objects and their description should be made accurately. The following are some of the elements that should be observed by developing the checklist of the survey:

Objects survey

1. Description: (sculpture, vase, textile, artifact, etc.); acquisition or museum number
2. Material: (stone, metal, ceramic, organic, cloth, plastic, composite, etc.)

    A. Material characteristic: brittle; elastic (flexible, soft)

    B. Condition: (is the object well preserved?) fragile, strong and robust (are all parts in the same condition? Or do they differ?)

3. Location

    A. On exhibition

    Floor (like free standing sculpture, artifacts or furniture) wall; hung on wall (like paintings, carpets or framed drawings); built in or on to wall (large reliefs or mosaics cemented into the wall); suspended from ceiling (chandeliers, lamps, or hanging sculpture); in case or vitrine; on shelves or supports; on pedestals or bases

    B. In storage

    Where in storage? Drawer shelf floor; table cabinet; hanging storage (compact storage wire racks); crate/box

4. General Category

    Standing (like sculpture or furniture); lying down (like large architectural fragments); hanging (like paintings or drawings, etc.); suspended (like chandeliers, lamps, or sculpture, etc.); anchored: where is the object anchored? In how many locations? How is it anchored (large metal clip, wire, rope, etc. Is the anchor sufficiently strong?) To what is it anchored (a pedestal, a wall, a false wall, a panel, etc.)?

5. Relocation (ease or difficulty of relocating the object)

Is the object easily moved and relocated, or does it require several staff members and/or machinery and lifting equipment?

6. Object is stored or displayed on a:

Pedestal; shelf; plinth; is it anchored to any of these? Is the pedestal, shelf or plinth securely anchored to the wall or to the floor?

7. Volume:

Large (for ex. A large figurative sculpture would be life-size or greater)

Small (for ex. A small figurative sculpture would be more like a figurine, something small enough to easily pick up with one hand.)

Medium (anything between large and small)

Heavy (a heavy object something that cannot be easily lifted by one person of average strength).

Light (an object that can be easily lifted by a person of average strength using one hand.)

Medium (anything between heavy and light)

8. Shape:

General shape of object (is it spherical, square, polygonal, tall and thin, short and broad, etc.?); footprint (the surface of the object on which it rests); is the footprint larger or smaller than the largest width or circumference dimension?

Is the bottom (footprint) flat, rounded, or uneven? (Does the object rock or wobble when it lightly pushed? Or does it sit flat and solidly?

9. Height to base ratio

This is a ratio between the total height of the object and the largest dimension of its footprint. The smaller the height is in relation to the base dimension the more stable the object is. The larger the height dimension is in relation to the base dimension, the more unstable the object is. For example, a perfect cube is 1:1. A stable platform might be 1 (or less): 2. A highly unstable object might be 5:1, etc.

10. Distribution of weight

Location of center or gravity. The lower the weight is concentrated, the more stable an object is. Is the weight : mostly at the top 1/3 of the object? Mostly at the bottom 1/3 of the object? Evenly distributed?

11. Eccentric elements

Are there eccentric elements (like outstretched arms) which would change the location of the center of gravity and the stability of the object?

12. Stability:

    Does it easily rock or does it sit flat and solid? Is it restrained from moving in any direction and from colliding with another object, the wall, etc. Is it restrained from rolling, tipping, or sliding?

13. Supports (Pedestal, shelf, plinth or case)

    Construction: is the support or case constructed in such a way that it is strong enough to withstand earthquake motion? For example, is it cross-braced? What is it made of, etc.? Condition: is the pedestal shelf or case in good condition, or is it old, termite- ridden? Are the joints still tight, or have they loosened with age and use? Stability: many of the same questions that are asked about an object's stability, such as distribution of weight, footprint size, height-to-base ratio, location and extent of anchoring, etc., are applicable to cases, pedestals and plinths. For example, a large heavy case holding a number of fragile objects should be considered highly dangerous if it is tall and thin with a small footprint or if it is standing on thin and weak legs. Connection to the object: is the object glued, clamped, bolted, screwed or nailed down to the support pedestal shelf or case? Or is it simply sitting on top of the support?

14. Proximity

    What is the proximity of the object to other objects, furniture or fixtures? Is the object exhibited or stored high above the floor or relatively close to the floor near a wall or toward the center of the gallery? Is it in a large case crowded with other objects or is it in a small case? Is it on a shelf above other objects or close to the floor of the gallery or case?

15. Location

    Is the object difficult to access? Would the object be difficult to move from its present location?

16. Secondary threats to objects whether they are in storage or in exhibition.

    These include things or material that might fall on the object, that might pour water corrosive fluids on the object, that might tear or rip the object, or that might cause explosions or fires. The proximity of these secondary threats should be noted in your survey. They may include but are not limited to the items below:

    - Ceiling fixtures (inset lights, ceiling panels or decorative elements)
    - False walls (or panels)
    - Hanging fixtures (lights, fans or decorative elements)

- Water pipes (for cooling, heating, sewage, or water source)
- Flammable or explosive materials (gas lines, solvent storage, paints, highly flammable textiles, etc.)
- Shelving or shelving units
- Cabinets
- Objects themselves can be threats to other objects or to visitors or staff. Is the object you are surveying a potential threat to people who might be near it during an earthquake?

17. Existing mounts or anchors

    Type; purpose (was the mount made to restrict movement of the object or hold it in a particular orientation?); condition (Is the mount in good condition or has it deteriorated or corroded?) Is the mount of sufficient strength to serve its purpose?

Identification of Priorities

After the evaluation of the collection, following the checklist above, objects should be divided into three general categories based on their susceptibly to damage during an earthquake:

<u>High</u>

Unstable or directly threatened by surrounding material

Will not survive even a small earthquake without damage or being destroyed

<u>Medium</u>

Unstable during a large earthquake

Not directly threatened by surrounding material

<u>Low</u>

May suffer minor damage during a large earthquake or is stable due to its shape, location or previous mitigation efforts

Many objects will overlap categories or it will be difficult to decide which category they belong to since they have characteristics belonging to both. It is always better to be more conservative and to assume the worse case. After the division of objects into three groups: high, medium and low, the high risk group can be divided into those that need immediate attention and those which can wait a short while. Categorising helps to determine the resources that are needed and to gather the materials and staff required. It will also help to determine the time it will take to seismically protect the collection. And, finally, it assures

that attention will be given to those objects at greatest risk before to move on to those that are less susceptible to earthquake damage.

Thinking about the connection between type of actions and time, four time frames can be identified:

Immediate: actions which can be taken with minimal cost and that can be done by untrained personnel with oversight by a museum staff member (for example, removing object from unsafe shelves and then boxing the objects or replacing the shelves. Packing or re-packing objects in more appropriate materials or restraining objects from moving).

Short term: actions which require staff members with some limited expertise in packing, re-packing, restraining or mounting objects; may require experts or craftsmen in carpentry or metal work to repair, re-build, build or install shelves, cases, or pedestals; require supplies and resources

Medium term: actions similar to “short term”, but with the support of museum staff who has received specific training in dealing with mitigation measures.

Long term: actions which require training or re-training of staff in specific approaches to exhibition or storage techniques that include a focus on seismic mitigation; require significant resources for the replacement of shelves, exhibition furniture, etc., and/or for the construction of more appropriate storage and exhibition furniture.

III.2.C.d. Objects Evacuation Plan

The Risk Management of movable heritage has some peculiarities. Apart from considering all the aspects related to the museum building and its emergency plan, which are common to immovable heritage too, one of the aspect to be considered in the risk management of museum collections is the evacuation plan of museum objects and its related documentation (inventory in paper and digital format, pictures, etc.). This plan has to be designed, tested and put into place whenever necessary.

Of course, the emergency situation caused by a fire, by a flood, by an earthquake, by a theft, and so on, is different case by case. It is therefore necessary to describe a possible scenario of what could happen in the museum (room by room, floor by floor,...) if a fire will happen, if a flood will happen, and so on. This permits to anticipate and identify the possible risks and the consequent damages.

In order to decide which object can be evacuated in occasion of an emergency it is necessary to identify the criteria/values for singling out the list of priority objects. These criteria have to be crossed with the different type of emergency and its entity.

The definition of the “values” and of the “priority list” should be done in team, where different professional profiles (Security Manager, Conservator/Restorer, Curator, Fireman, Museum Director, etc.), can participate with their own professional contributions.

The loss of a museum object means a loss of value for the local, national, international community. The list of values that are relevant to the “X museum”, should have to be identified in order to create a reference table (Table 1.).

A rate range has to be defined too. The object with the highest number is the one to be put on the top of the priority list (see the following table: Object 1 with 33 points).
This result can of course be discussed again during the team session and readjusted. The value’s table should be adapted, time by time, considering different possible risks.

The following list of definition of the Type of Risks associated to agents of deterioration (Michalski 2004 and 2007) can be used as a reference when establishing the criteria/values:

1. Direct Physical Forces (earthquake, building collapse, volcanoes, tsunamis …)
2. Criminals (war, theft, vandalism, illicit escavation and traffic…)
3. Fire (arson, electric short circuit…)
4. Water (floods, water leaking…)
5. Pests (insects, roditors, mice…)
6. Contaminants (gas, pollution...)
7. Radiation (UV/unnecessary light: internal light, external light)
8. Incorrect Temperature (air conditioning break down, extreme climate…)
9. Incorrect Relative Humidity (air conditioning break down, extreme climate…)
10. Dissociation (human information not available anymore, loss of inventory, loss of labels)

The following table shows an example of which kind of values/criteria can be considered for a sample of three museum objects in order to prioritise the evacuation in case of an emergency.

CRITERIA/VALUES FOR SINGLING OUT THE LIST OF PRIORITY OBJECTS FOR EVACUATION

Type of object	Economic value (insurance)	Symbolic value	Subjective value	Historic value	Collection Contest value	Accessibility	Weight	Encumbrance/ Bulk	Fragility	Intangible relation	TOTAL
Object 1 Part of a golden crown	4	2	5	4	3	1 (exhibited in a locked showcase)	5	5	3	1	**33**
Object 2 Contemporary Art Mobile (ex: Calder)	3	2	4	3	3	2	4	1	1	1	**24**
Object 3 Feathers head cover	3	4	3	2	5	1	5	2	1	5	**31**

Scale: from 1 to 5, being 5 the highest value

III.2.C.e. "Risk" Assessment Methodology for Mosaics

I present here a method to assess the state of conservation of mosaics in Israel developped by Jacques Neguer and Yael Alef of the Conservation Department of IAA (Israel Antiquities Authority). The interesting point of this research methodology, which provides a systematic quantitative tool for mosaic risk assessment, is the emphasys that is brought to the "quickness" of the method. Often survey and assessment methods require a considerable amount of time for the collection of the data, for their analysis and for the identification of the action to undertake. Being applied only to one typology of cultural heritage –mosaics– this method is offered as an alternative to more complex risk assessments. The Scale of "risks" is determined from 1 to 4, being 4 the biggest risk.

This initiative principally developped to evaluate the protective performance of shelters began in 2004 as a collaborative project of English Heritage, the IAA (Israel Antiquities Authority) and the Getty Conservation Institute. The initial step was a "Rapid Assessment" of existing shelters over mosaics. From the rapid assessment, it was hoped to achieve a basic grasp of the condition of mosaics protected by shelters. The research presents the results of the rapid survey of 36 shelters covering 105 mosaics in Israel.

III.2.C.e.1. Results of the "Rapid Assessment"

The results provide information on the condition of the mosaics in general and differences between re-laid and *in-situ* mosaics in particular. Of the total number of 105 mosaics (in an area of 3729 sq m) under shelters, 3 (3%) mosaics (an area of 199 sq m), are re-laid on epoxy support, 25 (23%) mosaics (an area of 753 sq m), are re – laid on concrete support and 78 (74%) mosaics (an area of 2867 sq m) are *in-situ*. In addition the results provide information about the impact of the "phenomena" (Neguer, J., & Alef, Y. 2008) on the condition of the mosaic. It is interesting to note that what I have indicate until here as a "hazard" is called here a "phenomenom".

Calculation of the results of the evaluation of the mosaics under shelter is based on an onsite condition assessment. Each phenomenon that was identified was graded from 0 to 4 according both to its extent and to its degree of severity. Then a total score of the cumulative rating was calculated by adding together the score of the extent and of the degree of severity. The cumulative rating reflects the condition of the mosaic. The quantitative results enabled the analysis of the data according to the different phenomena as well as comparison between the

cumulative rating of the sites, types of mosaics support and types of shelters. The results of the Rapid Assessment from Beit Alpha Synagogue mosaic (Table 2), provides an example for the method of calculation.

Mosaic condition	Phenomena	Yes/No	Extent 0 - 4	Severity 0 - 4	Score
Surface Condition	Efflorescence		1	1	
	Plants		0	0	
	Micro-biological growth		0	0	
	Disaggregation		0	0	
	Exfoliation		0	0	
	Fracturing		2	4	
	Erosion		1	1	
Structural Condition	Cracks		1	4	
	Bulges		0	0	
	Depression		0	0	
	Loose tesserae		1	1	
	Detachment		0	0	
	Deteriorated Preparatory layers		0	0	
Deterioration of Previous Intervention	Surface treatments		1	4	
	Structural support		1	4	
	Damage from plants removal		0	0	
Evidence of Animal	Bird droppings	No			
	Animal droppings	No			
	Animal or insect burrows	No			
	Visitors walking on mosaic	No			
Loss	Cumulative loss		1	1	
Total	**Cumulative Rating**		**9**	**20**	**29**
	Risk Assessment				**2**

Table 2. Beit Alpha Synagogue mosaic Rapid Assessment results

Additional information concerning the history of the mosaic and shelter (i.e. excavation date, date of shelter construction); shelter typology (i.e. enclosed by walls, open); number and area of mosaics and mosaic treatment (i.e. *in-situ*, re-laid in cement or epoxy support) was also collected. The comparison of the cumulative rating of all the mosaics reflects which are in better condition and which are more "at risk" (Table 3).

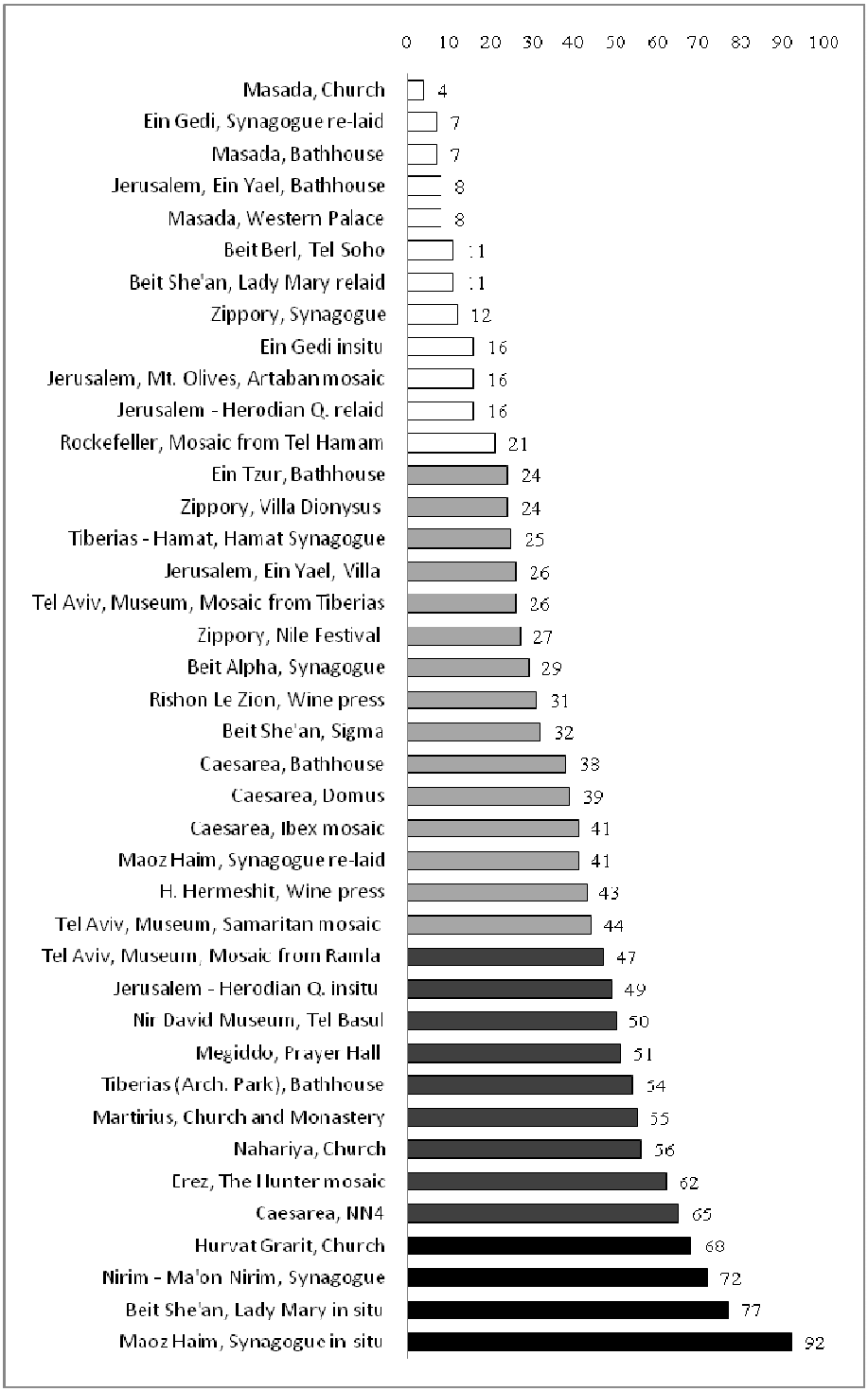


Table 3. Distribution of cumulative rating of mosaics under shelters in Israel

This distribution was divided into 4 levels of mosaic condition: (the lowest level 0 – 22) good - and no risk -, (23 – 44) stable - and low risk -, (45 – 66) active deterioration - and moderate risk-, (the highest level 67 – 92) endangered - and high risk - (Tables 4)[5].

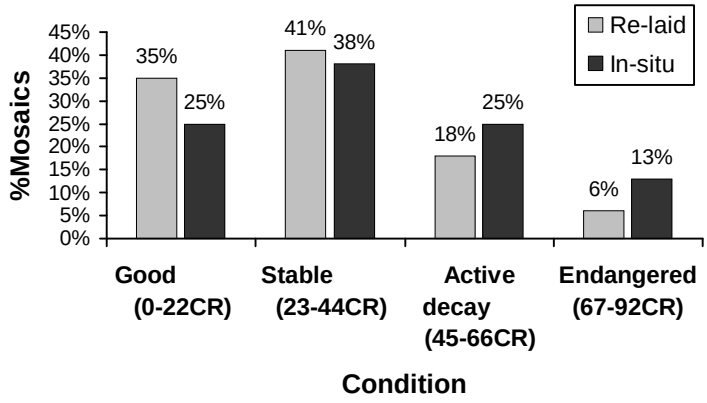


Table 4. Comparison of rating between in-situ and re-laid mosaics

The results show that 30% of the mosaics examined are in good condition, around 40% are stable, around 22% are undergoing active decay and around 10% are in very bad conditions and some of them have already been lost.

The quantitative assessment enabled the analysis of the weight of the different phenomena for all the mosaics, as well as re-laid vs. *in-situ* mosaics. The weight of each phenomenon was calculated by adding its occurrence (in percentage) in all the mosaics condition assessment. For instance, 'cracks' appeared in mosaics under 33 shelters out of 40 (including separated *in-situ* and re-laid mosaic under the same shelter), that is in 83% of the shelters (Table 5).

[5] The level of risk was not indicated in this research method. I have added it as it seams to me to be a useful score to translate the so colled “Rapid Assessment” into a “risk assessment”.

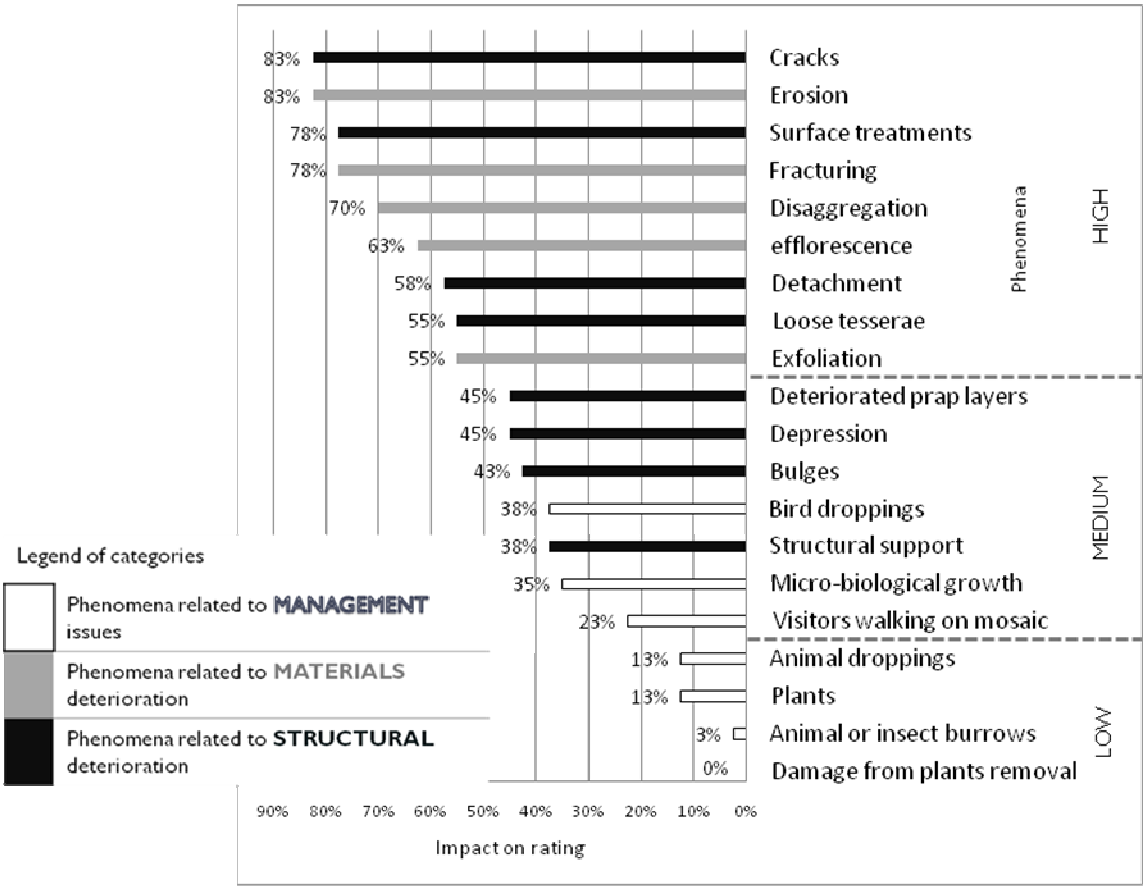


Table 5. Phenomena weight distribution

The phenomena in Table 5 are grouped into three main categories: management, structural and phenomena related to the material properties of the mosaic. Management issues in most cases are related to the effectiveness of the maintenance of the shelter and the mosaic and measures for safety and security. Structural issues are related to the building stability (i.e. movement of foundations and floors supporting the mosaic) and use of new conservation materials such as iron bars and cement casts. The condition of the material properties is usually an indication for the specific microclimate conditions under the shelter, including presence of humidity and salt crystallization.

Those categories are distributed in 3 main levels, indicating their level of impact:

- Low impact – phenomena in the lower part of the graph such as 'Plants' or 'Animal borrows' – statistically does not indicate deterioration processes under the shelter.

- Medium impact – phenomena in the middle part of the graph such as 'Depressions' or 'Bulges' – is statistically an indication for insignificant deterioration processes under the shelter.
- High impact – phenomena in the higher part of the graph such as 'Erosion' or 'Fracturing' – is statistically an indication for active deterioration processes under the shelter

Some general conclusions may be drawn from these results. Looking at the statistical weight of each phenomena (how many times it occurs), we can note that phenomena related to management issues seem to have low impact (21% - average of management phenomena in the shelters). Phenomena related to structural issues are concentrated in the middle part of the graph (55% - average of structural phenomena in the shelters), thus having medium impact. Phenomena related to material properties are concentrated in the higher part of the graph (70% - average of material phenomena in the shelters) with high impact.

I will not go into the details of the considerations that relate to the results of the research, as it is not the aim here. In this method, the “phenomena” are principally effects more than causes of a hazard. What is useful in this case is the classification of the “phenomena” into three cathegories: related to management issues; to material deterioration and to structural deterioration. This simple division can facilitate the work of the site manager in identifying the priority solutions.

The researchers describe their methodology as follow:

> “… The major advantage of the methodology seems to be in providing a systematic quantitative tool for mosaic condition assessment (i.e. risk assessment). Applying the methodology by different people in the same country or in different countries permits statistical and comparative analysis, which apart from a decision making tool may reveal new information and new understanding of the behavior process of mosaics under shelters. Quantitative data for the evaluation of shelter performance can be further elaborated using the Italian 'Risk map' model. The methodology enables evaluation of the impact of the phenomena on the condition of the mosaic. The analysis of the phenomena allows for better selection of the data required for the evaluation and its application. While some phenomena were statistically found to have high impact i.e. 'cracks', others such as 'Damage from plants removal' were found to be not relevant at all. In addition,

> some phenomena are only relevant for *in-situ* mosaics where others are only relevant for re-laid mosaics. This requires some modification of the analysis of the data such as separating the phenomena according to re-laid and *in-situ* mosaics." (Neguer, J., & Alef, Y. 2008)

The Rapid Assessment was found by the researchers to be a useful tool in reflecting the condition of mosaics under shelters and influencing decision making process concerning sheltering and treatment of mosaics. The quantitative data enables to identify the condition (i.e. good- endangered) – and the risk scale - of a regional or national mosaic inventory and risk map which can be used as a tool for decision making regarding the type of intervention, needs and resources. The assessment provides information that influences ongoing decision-making. It also provides a 'scientific' backup/support for the conservators when negotiating with decision-makers on projects related to shelters for example.

III.2.C.f. The Manual of Collection Risk Management

ICCROM has been particularly active in the last 30 years in developing strategies, tools, training activities and methods (Antomarchi, Feilden, de Guichen, Jokilehto, Stovel, Stanley Price ...) concerning the disaster risk management field in collaboration with major institutions and organisations dealing with the protection and preservation of cultural properties (GCI, UNESCO, ICOMOS, ICOM, CCI, ICN, Istituto Centrale del Restauro (ICR)...). Among the tools that ICCROM developped there is the Manual of Collection Risk Management which is still in progress.

This manual was initiated in 2007 by ICCROM, the Canadian Conservation Institute and the Netherland Institute for Cultural Heritage. The manual emerges from material developed for a training course called "Reducing Risks to Collections", offered in 2003 in Ottawa, in 2005 in Rome[6], in 2006 in Ottawa and in 2007 in Sibiu.

The method used is based on a Risk-based decision-making process that considers as the ultimate goal:

> "To maximize the benefits of the heritage resource over time, as measured at some specified point in the future, and for a given cost"

and as practical goal:

> "To assess the risks to our collection, and act to reduce them as effectively as possible, given the available tools and practical resources."

The core of the manual is built around the 7 steps of the risk management cycle (Fig.29.). There are 5 "sequential steps" of doing risk management:

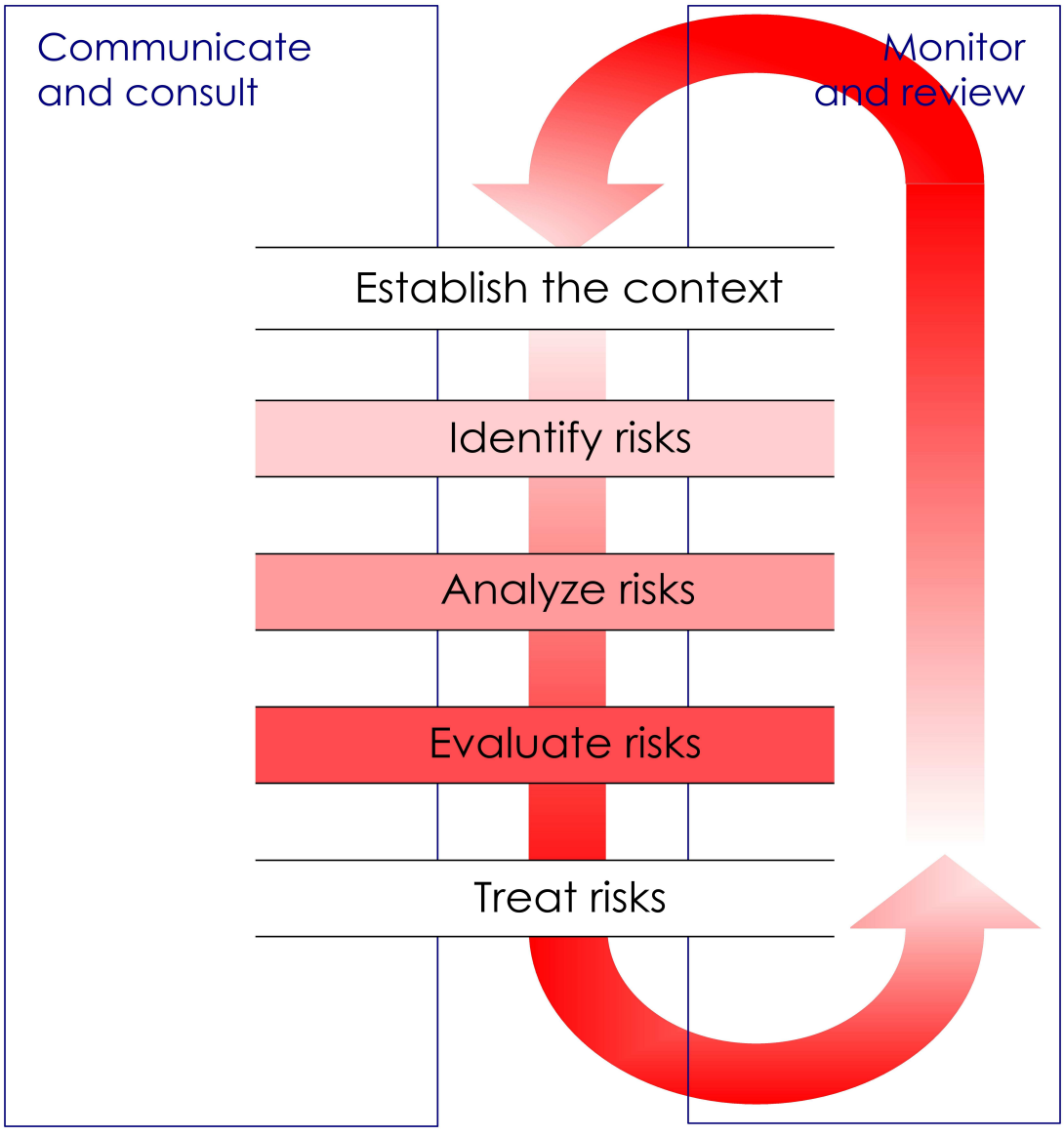
- Establish the context
- Identify risks
- Analyze risks
- Evaluate risks
- Treat risks

plus two "ongoing steps":

- Communicate and consult
- Monitor and review

[6] I was one of the participants in this course.

The complete risk management cycle used and further developed in the manual is ispired by the Risk Management, Australian/New Zealand Standard, AS/NZ 4360/2004.



THE COLLECTION RISK MANAGEMENT CYCLE

based on *Risk Management, Australian/New Zealand Standard, AS/NZ 4360:2004*

Canadian Conservation Institute · Institut canadien de conservation · ICCROM · instituut collectie nederland · Onderhoud Erfgoed

Fig.29. The Collection Risk Management Cycle.(© CCI, ICCROM, ICN)

The following actions are considered in the seven steps of the cycle:

Establish Context

- Be sure of your task. The scope. What decisions will it guide?
- Select an appropriate approach from the hierarchy of risk-based methods
- Understand all appropriate documents: museum mandate, preservation policies, statements of significance, etc.
- Begin appropriate consultation processes with staff, experts, stakeholders
- Do a first draft of the Collection Value Pie, based on your current knowledge.

Identify Risks

- Choose the frameworks or checklists appropriate to the scope of your task.
- Make a list of the specific risks, using brief summary sentences.
- Write a first draft of the risk scenarios, based on your current knowledge.

Analyze Risks

- Try scoring immediately the draft scenarios, using the ABC ½ point scales
- Select either the paper-based method or the spreadsheet method.
- Refine the estimates of A, B and C for each scenario
- Identify and locate the information needed to improve scenarios where necessary
- Aggregate or disaggregate scenarios as needed
- Assemble a report comparing magnitudes of risk, discussing uncertainties, and sensitivity to changes in the collection value pie.

Evaluate Risks

- Compare the risks in terms of both magnitude and uncertainty.
- Look for links between risks
- Understand the sensitivity of the magnitudes to the collection value pie. Reconsider the collection value pie if necessary.
- Consider the external and internal contexts, such as special programs, finance, etc., that influence the decisions on which risks to treat.

Treat Risks

- Develop risk treatment options. Use the tools provided to aid imagination.
- Find synergies, options that address multiple risks.
- Remember the goal: minimize the loss of value to the collections in the future.
- Choose a set of options.
- Establish the costs and feasibilities.

- Review the evaluation step if necessary, and which risks to treat.
- Plan and implement the options.

Communicate and Consult

- Throughout the process, talk it up, engage collaborators! Explain the risk approach if it is novel.
- Talk to experts and stakeholders, as well as colleagues when refining scenarios.
- Make clear reports, clear graphs. Documents the process.

Monitor and Review

- At each step, be prepared to go back and review a previous step.
- Review the risk reductions achieved by the treatments.
- Coordinate future cycles within the existing cycles of the institution's management.

III.2.C.f.1. Case Study-Risk Assessment of ICCROM Archives

A risk assessment was carried out in the ICCROM Archives by Tharron Bloomfield, Neela Dullabh, Cristina Menegazzi, John O'Neill, Alicia Tonello, Jedert Vodopivec between June 6 – June 24, 2005 in occasion of the training course "Reducing Risks to Collections" organised by ICCROM in Rome.

I present here the conclusions of the risk assessment undertaken in occasion of which risk assessment methods, specifically developped for the course, were used.

The comprehensive classification of the agents of deterioration (Michalski. 1987, 1990) was used in order to identify the priority risks. Nine agents of physical deterioration, and one agent of non-physical deterioration (custodial neglect), are listed in column 1 of Table.6. The list of examples of risks is not exhaustive and is compiled in accordance with the most likely risk in the concerned region where the risk assessment is undertaken.

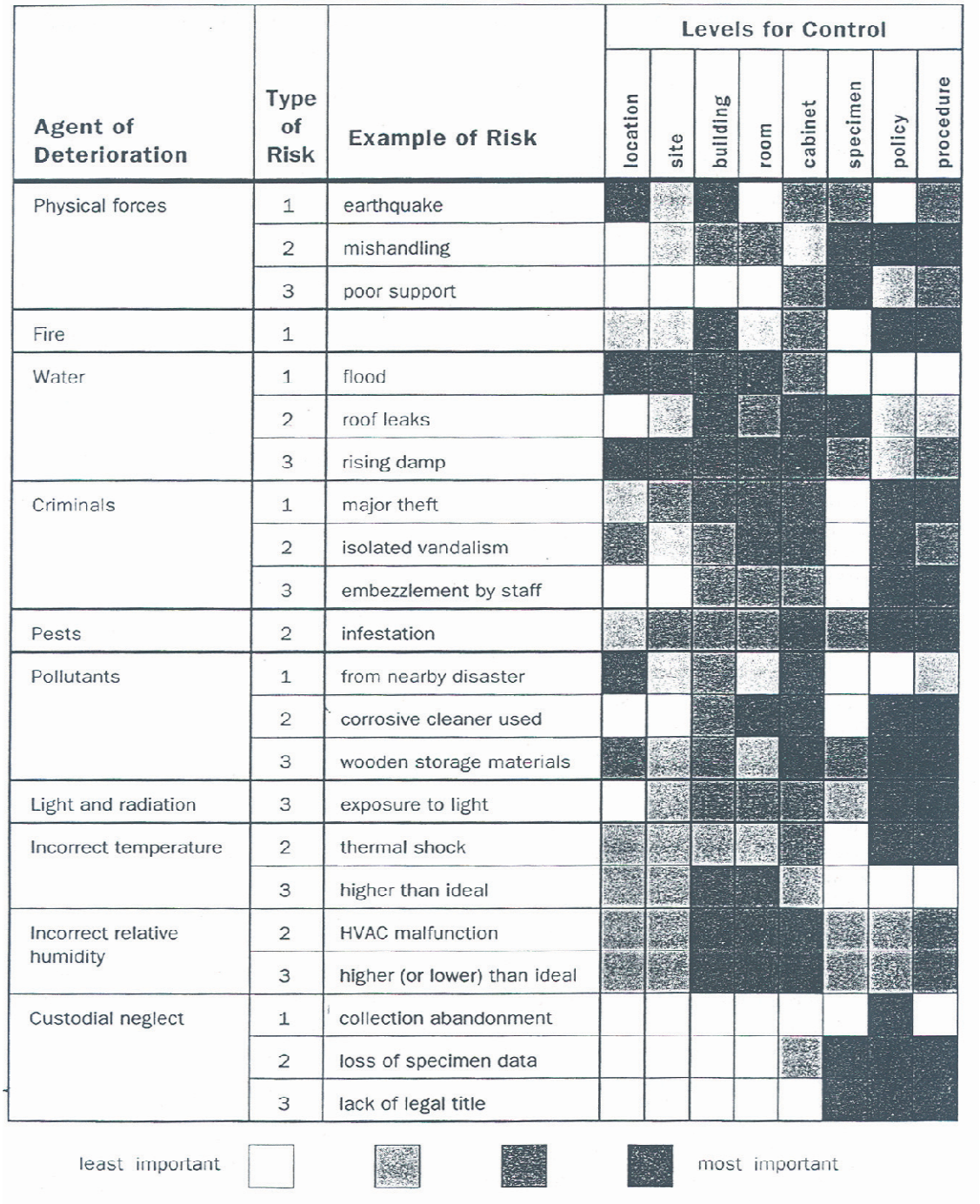


Table 6. Specific examples of types of risk and the relative importance of implementing means of control at each possible level for control. Type of risk: 1 = catastrophic; 2 = severe and 3 = mild/gradual. (© S. Michalski).

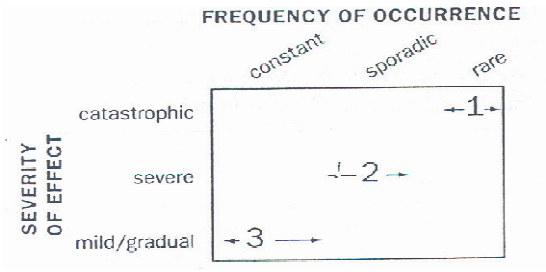


Fig.30. The ranges of frequency and severity of the types of risk (1, 2, and 3) (© R. Waller).

Each agent of deterioration can be manifested as one or more of three different types of risk, characterised by the frequency of occurrence and the severity of effect on collections. This is shown schematically in Fig.30. (Waller, 1994).

Three types of risk are considered:

1) rare and catastrophic,

2) sporadic and severe, and

3) constant and mild/gradual.

Information on type 1 risks (infrequent disasters) must be obtained from central agencies such as geological surveys, flood prediction authorities, and insurance data offices.

Information on type 2 risks (intermediate frequency), such as damage from mishandling, must come from conservation documentation. The magnitude of type 2 risks can be determined precisely only through analysis of condition data over time. This fact further supports the need for collection and specimen condition reports and suggests some of the information that these reports must record.

The magnitude of type 3 risks (constant) should come from conservation science studies coupled with monitoring of environmental conditions in collections.

Means of Control

After all risks to a collection have been identified and their magnitude quantified, or at least estimated, risk mitigation strategies can be explored. Three basic means for mitigating a risk can be schematised as follow:

1) eliminate the source of the risk (avoid)

2) establish a barrier (block)

3) act on the agent responsible for the risk (detect, respond and recover)

Case Study presentation

The archive at ICCROM contains institutional records of ICCROM, meaning records produced by ICCROM during the course of its administration and activities. There are approximately 350 linear meters of archive space which include documents, bound volumes, drawings, posters, banners, photographs, microfilms, audiovisual material and digital material.

The group had an introductory site visit and a meeting with ICCROM archivist on June 8, 2005. A detailed dossier with information about the archives was also provided to the group.

Eighteen risks were identified for all of the ten agents of deterioration. For each risk a scenario was worked out, the extent of potential damage was identified, the information that needed to be found out was identified, the fraction of the collection that was effected was calculated and the factors that either mitigated or magnified the risk were noted. This information is outlined in the following table (Table 7.).

Table 7. ICCROM Archive'risk assessment -Risk Identification and scenarios descriptions.

Agent	Risk	Frequ.	Scenario	Damage	What we need to know	Fraction of collection at risk	Mitigating Factors	Magnifying Factors
Direct Physical Forces	Collapsing of building	R	The building housing the archives has an unstable foundation, and there is a history of previous collapse of part of the building about 20 years ago. The scenario is that the building structure housing the archives will collapse, either completely or partially.	Physical damages to the archival materials: tearing of paper, crushing of CDs and videos, physical damages to all materials affected. Fire due to gas leaks will cause loss of materials Water from the fire suppression and from broken water pipes will cause water damage to all materials, and mould Dirt and dust and debris will cause damage to materials Extensive dissociation of materials will occur due to materials falling out of boxes, and loss of labels and identifying markers.	What is the stability of the building that houses the archives? Are the cracks in The Archivist's office wall structural, or simply in the plaster layer?	The entire collection is at risk: paper, film, digital media, CDs, videos, books. Damages would be extensive and widespread **Three stars *****	Much of the collection is in boxes, which would protect the contents to some degree. There is professional staff available who would intervene quickly.	There is no emergency plan in place.

	Handling	C	When The Archivist has to search documents placed in the upper shelves there is a risk of falling them down and possible breakages (and eventually dissociation and loss of information). When The Archivist receives the files she doesn't inspects them all immediately and without gloves and doesn't put them into folders, boxes and envelops and leave them in the open air.	If films, audiovisual and optical documents fall down they can became dusty for electrostatic factors and it is very dangerous for magnetic documents. Some old envelops and boxes could break during handling.		-/* nothing/ small fraction 1%	The Archivist is very careful, skilled and committed. The Archive's is not consulted very frequently and most of the time is for ICCROM staff. The Archivist is the only person who handles the boxes and folders, films and documentations from her office to the storage and from the storage to her office which is also the reading room. Currently there is enough space for moving and carrying objects and to place them for being consulted. The Archivist wears cotton gloves all the time whenever she handles the documents.	Grows of the collection

Agent	Risk	Frequ.	Scenario	Damage	What we need to know	Fraction of collection at risk	Mitigating Factors	Magnifying Factors
Criminals	Theft external	S	A criminal obtains the code for the exterior door which opens onto the street. She/he enters the archive from the exterior by entering the code and ascending the staircase. She/he enters the Archives through the door that is never locked, and steals objects, leaving the building unseen by the same staircase. There is no staff person present in the Archives storage and the criminal's activities are not seen.	Loss of archival materials.	How many people have the code to the exterior door? How often is the code changed? Why is the door at the top of the staircase not locked from the exterior?	The entire collection is potentially at risk: paper, film, digital media, CDs, videos, books. **One stars ***	A criminal would be limited to the amount of material she/he could carry, so losses would not be extensive. There is little street value to the archives collection, so the motive for theft is not great Few criminals will know of the location of the archive and its contents	If the door is not closed further theft can occur. For example equipment or the person could come back later
	Internal staff theft	S	An ICCROM staff member will take archives. They do this because they feel an ownership of the information they have created while working.	Loss of material	Are there security checks for staff	**One Star ***	The Archivist works in close proximity to the archives	There is no security so undetected access to the archives is very easy

Agent	Risk	Frequ.	Scenario	Damage	What we need to know	Fraction of collection at risk	Mitigating Factors	Magnifying Factors
Fire	Kitchen gas	R	The kitchen is in use and flames start to burn the oven and the furniture which are close. There is a fire extinguisher, but nobody knows how to use it. The smoke detectors (verify) start the alarm and the Fire Brigade will not come and the fire will spread up to the Archives.	Burning of the paper materials and the plastics will cause complete loss of these materials. Smoke damage will cause obscuring of documents Water from the fire brigade will cause mould. Some dissociation of materials will occur due to water damage, smoke damage, materials falling out of boxes, and loss of labels and identifying markers.	Are there smoke detector in the kitchen? Is the Fire Brigade contacted by the Security Company or is there a direct connection when the alarm starts? Is the Fire Brigade close to ICCROM/how much? Does the Fire Brigade know the ICCROM buildings and the Archive Collection?	**Three Stars *** **	The kitchen is used only during the ICCROM courses (2/3 times a year) and only during lunchtime, so it reduces the risk likelihood. There are no curtains and other very inflammable elements. There is an iron ceiling.	Presence of gas. Eventual lack of knowledge on how to use the fire extinguisher. There is no emergency plan.

	Electric Short Circuit	S	There will be an electrical short circuit during the night within the archives storage rooms that will cause a fire. There will be a delay in the action of the smoke detector because air circulation is poor, and there is only one detector in the center of each room. The smoke detector will alert the security company that there is a fire, and it will shut off the air conditioner to stop the air circulation. There is no fire suppression system in the archives storage rooms, so the fire will be limited only by the amount of oxygen present.	Burning of the paper materials and the plastics will cause complete loss of these materials. Smoke damage will cause obscuring of documents Water from the fire brigade will cause mould. Some dissociation of materials will occur due to water damage, smoke damage, materials falling out of boxes, and loss of labels and identifying markers.	What type of smoke sensors are present? How quickly do they detect a fire? How often are the smoke detectors tested? What is the average response time for the local fire fighters? Is there a security guard on duty all night who could suppress a small fire with the fire extinguisher? How will the fire department enter the fire area when they get here? Do they have an access key?	The entire collection is at risk: paper, film, digital media, CDs, videos, books. Damages would be extensive and widespread **Three stars *****	The fire doors at each end of the storage rooms are air tight and would limit the air feeding a fire. Much of the collection is in boxes, which would give some minimal protection to the contents.	There is no emergency plan in place.

Agent	Risk	Frequ.	Scenario	Damage	What we need to know	Fraction of collection at risk	Mitigating Factors	Magnifying Factors
Water	Roof Leak	S	Heavy rains fall on Rome for several days. The roof will leak, and water will penetrate into the building above the archives' 3 storage rooms. The water will penetrate through the ceiling and drip onto the archival materials.	soaking of the archival materials with water expansion of the books and documents so that they fall off the shelves, causing physical damage mould dissociation of information, due to loss of water-sensitive inscriptions and information.	What is the annual rainfall in Rome, and what is the frequency of heavy rains? How many of the top shelves are protected by a water shield? How close to the floor are the bottom shelves of materials? What is the history of roof leaks in the past? (north wing; elsewhere?)	All of collection is at risk. The paper materials are most vulnerable; the CDs are the least vulnerable. The materials on the top shelves and on the bottom shelves are the most vulnerable. **Two stars ****	Much of the collection is in boxes, which would protect the contents for a period of time There is professional staff available who would intervene quickly.	There is no emergency plan in place.
	Flood caused by the River	R	Heavy rains fall on Rome for several days. The river will swell and overflow. The ICCROM building will be damaged by flooding and the archives are damaged by the flood waters. The damage caused is the archives becoming wet, physical damage, mould and dissociation.	soaking of the archival materials with water expansion of the books and documents so that they fall off the shelves, causing physical damage mould dissociation of information, due to loss of water-sensitive inscriptions and information.	What is the frequency of heavy rains in Rome? Is there a history of the river flooding?	All of the collection is at risk. The paper materials are most vulnerable; the CDs are the least vulnerable. The materials on the bottom shelf are the most vulnerable. **Two Stars ****	Much of the collection is in boxes, which would protect the contents for a period of time There is professional staff available who would intervene quickly. The river is confined with very high walls.	There is no emergency plan in place.

Agent	Risk	Frequ.	Scenario	Damage	What we need to know	Fraction of collection at risk	Mitigating Factors	Magnifying Factors
Pests	Mice infestation	S	Food in the kitchen will result in mice entering the archive leading to nesting and multiplication. This will cause damage to paper.		Does the Archivist do spot checks for pests?	Small fraction of risk as an infestation should be detected before much damage is done. **One Star ***		
	Insects	S	Holes in Archivist's office wall					
Contaminants	Not appropriate boxing	C						
	Gas from objects	C	Acetate films will continue to deteriorate due to inadequate storage. This will cause vinegar syndrome – a chemical reaction that produces acetic acid which will lead to complete deterioration of the films unless the conditions are changed. Once the reaction is started, it cannot be stopped	The damage caused will include shrinkage, embrittlement and buckling of the emulsion on the film. The risk is continuous and is certain to eventually cause complete loss of the film collections	What is the frequency of AD testing that takes place? What is the number of films in the collection?	The entire collection of film is at risk although this is a small percentage of the entire collection **One Star ***	AD testing is carried out	Once the reaction has begun it cannot be stopped or reversed

Agent	Risk	Frequ.	Scenario	Damage	What we need to know	Fraction of collection at risk	Mitigating Factors	Magnifying Factors
Radiation	Internal Lighting causing fading	C	The lights will cause fading of documents in Archive, because the neon are not filtered.		Has The Archivist detected any light damage	Very low risk. Small fraction of risk **-/One Star ***	Most of the documents are in boxes	
	External light	C	The light coming from the windows which are a little bit open will cause fading.		Has The Archivist detected any light damage	Very low risk. Small fraction of risk -/**One Star ***	Most of the documents are in boxes	
Incorrect Temperature	Air conditioning break down	S	The air conditioning unit in the archives breaks down during ferragosto (Mid August) Nearly everyone in Italy is on holiday. Rome is very hot causing the temperature in the archives to increase dramatically.	The films and photographic material will be particularly susceptible to damage. The rate of chemical degradation in this material will increase dramatically in these high conditions. Plastics enclosures are susceptible to damage in high temperatures.	What is the regime during feragosto? Will someone check the archives while The Archivist is away?	The film and photographic material is particularly at risk (around 7% of the entire collection) **Three Stars*** ** For the film collection **One Star ** ** For the entire Collection.	The air conditioning unit is checked regularly throughout the year Most of the collection are stored in boxes	There is poor insulation in the building

	T too high for films, videos …	C	Acetate films will continue to deteriorate due to too high temperature for this kind of material. This will cause vinegar syndrome – a chemical reaction that produces acetic acid which will lead to complete deterioration of the films unless the conditions are changed. Once the reaction is started, it cannot be stopped	The damage caused will include shrinkage, embrittlement and buckling of the emulsion on the film. The risk is continuous and is certain to eventually cause complete loss of the film collections		The film and photographic material is particularly at risk (around 7% of the entire collection) **Three Stars*** ** For the film collection **One Star ** ** For the entire Collection.	The air conditioning unit is checked regularly throughout the year Most of the collection are stored in boxes	The current temperature is around 18C (in summer can reach 20 C) and is continuously like this.
Incorrect Humidity	Air conditioning break down	S	The air conditioning unit in the archives breaks down during the Christmas holiday. Nearly everyone in Italy is on holiday. Rome is very humid (???) causing the relative humidity in the archives to increase dramatically.	High humidity causes mould growth, encourages pests and chemical deterioration to paper based materials	What is the regime during Christmas? Will someone check the archives while The Archivist is away?	The material that is not stored in boxes will be most at risk **Two Stars ** **	The air conditioning unit is checked regularly throughout the year Most of the collection are stored in boxes	There is poor insulation in the building

Agent	Risk	Frequ.	Scenario	Damage	What we need to know	Fraction of collection at risk	Mitigating Factors	Magnifying Factors
Dissociation	Content of videos and films is not known	C						
	Human information not available anymore	S	Material is given to the ICCROM archives with no information about its provenance or origin	Loss of information	Are there plans for a record management system in the future?	**Two Stars** **		There is no record management system – lack of policy Lack of technology e.g. Old computers, how to read this information Time consuming process Much of the information is connected with different parts of the world or institutions that no longer exist

Frequency: **R Rare** **S Sporadic** **C Continuous**
Frequency Scale *Rare*: each 100 years or more *Sporadic*: each 10/25 years *Continuous*: every day

Each scenario was worked through and numbers calculated using semi-quantitative and quantitative methods so that each risk could be ranked. For the quantitative method the system used was decimal per year as some of the most vulnerable material could be lost in less than 100 years (Table 8.).

Agent	Risk	Frequ.	Semi quantitative	Quantitative	Priority
Direct Physical Forces	Collapsing of building	R	6	0.005	4
	Handling	C	3.5	0.000005	
Criminals	Theft external	S	4.5	0.000001	
	Internal staff theft	S	5.5	0.00001	2
Fire	Kitchen gas	R	5	0.0005	
	Electric Short Circuit	S	5.5	0.00375	5
Water	Roof Leak	S	3	0.0000001	
	Flood caused by the River	R	4	0.0002	
Pests	Mice infestation	S	4	0.0000009	
	Insects	S			
Contaminants	Not appropriate boxing	C			
	Gas from objects	C	1.5	0.0009	
Radiation	Internal Lighting causing fading	C			
	External light	C			
Incorrect Temperature	Air conditioning break down	S			
	Too high T for films, videos …	C	6 + 1 = 7	0.00176	1
Incorrect Humidity	Air conditioning break down	S			
Dissociation	Content of videos films is not known	C			3
	Human information not available anymore	S			

Table 8. ICCROM Archive'risk assessment-priority identification.

Looking at Table 8. ad Table 9. and considering the semi-quantitative system, the three priority risks are: 1: too high temperature; 2: Collapsing of building and 3: with the same score, Internal staff theft and Electric short circuit.

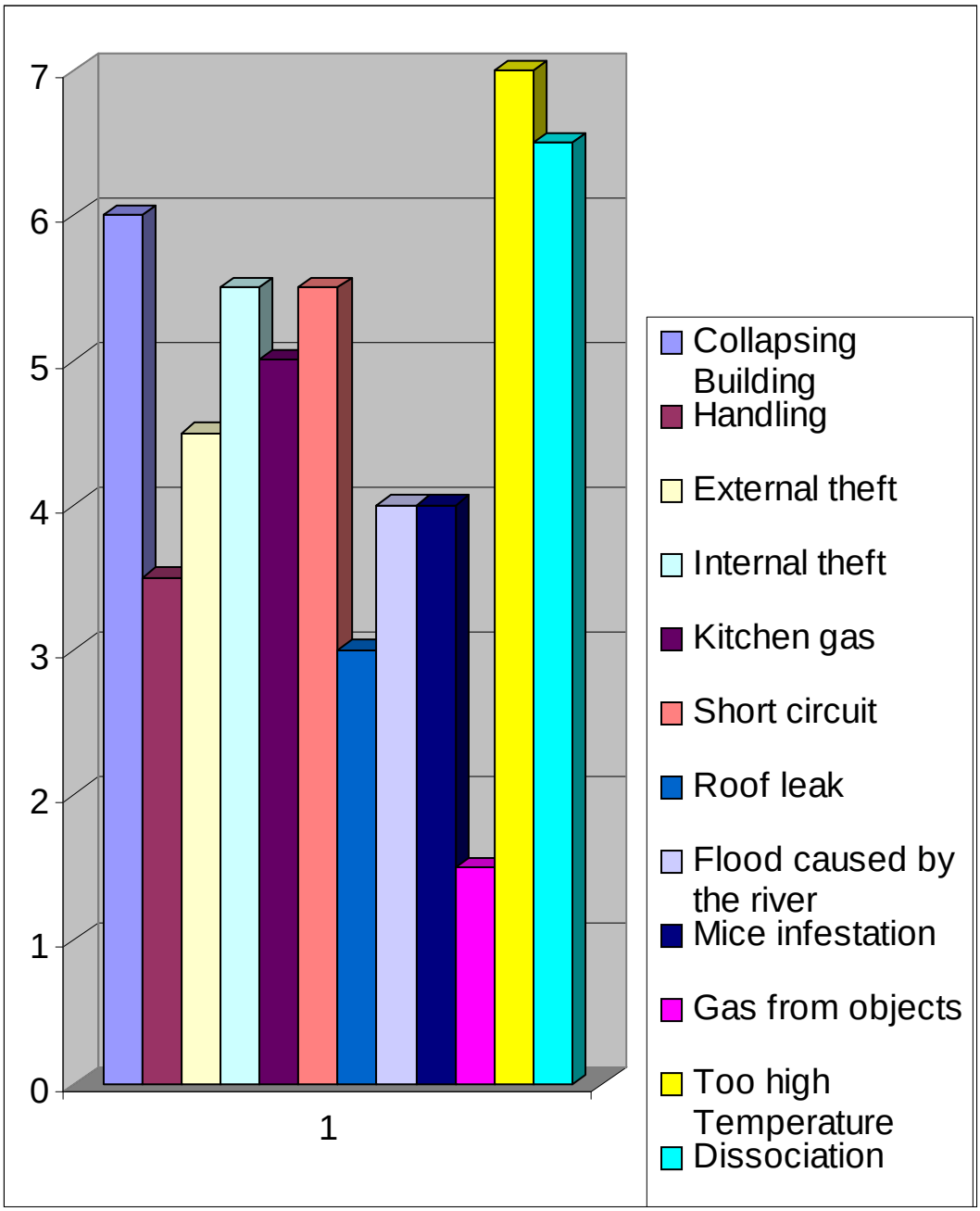


Table 9. ICCROM Archive'risk assessment-hystogramme of priority identification.

Five major risks were identified and three of them were developed after taking into account the high level of uncertainty for two of the risks (Table 10.). After team discussion and considering the uncertainty of the recurrence of the risks, the priorities have changed.

Agent	Risk	Priority
Incorrect Temperature	Too high T for films, videos …	**1**
Criminals	Internal staff theft	**2**
Dissociation	Content of videos and films is not known	**3**
Direct Physical Forces	Collapsing of building	**4**
Fire	Electric Short Circuit	**5**

Low
Moderate
High

		Priority 4 *Priority 5* RESEARCH
		Priority 1 Priority 2 Priority 3 **REDUCTION**
Low Risk	***Medium Risk***	***High Risk***

Table 10. ICCROM Archive's risk assessment - Uncertainty table

This risk assessment was done as an exercise and as such the results – while a good indication of what a complete risk assessment is likely to show – should be viewed accordingly. The three-week period at disposal was too short as time frame to carry out a risk assessment. I addition, only the material in the archive was assessed. There are more archives in other parts of the ICCROM building that should be assessed too in case of a more complete exercise.

Three Major Risks Identified

Risk 1: Too high Temperature
Incorrect temperature will damage the collection of films

Most of the colour films held by ICCROM are cellulose acetate. This material is chemically unstable and will release acetic acid as it deteriorates. This process is often referred to as vinegar syndrome due to the distinctive smell that indicates the material is breaking down to acetic acid. The conditions in the archives are a temperature of 16-20°C and a relative

humidity of between 43-46% in the spring and summer and a temperature of between 13-16°C and relative humidity of between 53-58% in autumn and winter. According to the Image Permanence Institute Index (www.rit.edu/ipi) these conditions create a "moderate" aging rate. The loss per year is between 0.04 and 0.012 and total loss will occur in between 44-74 years. Decreasing the temperature is the most efficient way to increase the life span of the colour film material. Although 13-20°C is cooler than the rest of the building, temperature needs to be reduced more dramatically to make an impact. The IPI calculator shows that each reduction in temperature of 5°C will double the lifespan of the film material.

Short Term Recommendation

A recommendation is to place the material in a frost-free refrigerator (179 .00 Euros each).

Long Term Recommendation

If the collection of color film continues to grow ICCROM may want to consider a cold storage unit, whether this is on site or off site. As the color film material is unique and total loss of the material is a certainty it should be seen as a very high priority for ICCROM to act on this recommendation.

Risk 2: Internal Thefts

Theft by an ICCROM staff member

ICCROM has an automated intrusion alarm system at the ground level floor and cameras at the main entrance to the building and in Via del Porto but this security does not cover the archives. There is no security in the archives. The internal door to the archives is always unlocked and the external door to the building can be opened by anyone who knows the access code. This creates a very real risk of theft from the archives. Due to the fact there is very little "street value" to any material in the archives and very few people from outside of ICCROM will know of the existence of the archives it is possible that archives could be stolen by a member of staff or someone who has connections to ICCROM. If archives are stolen it may be some time before they are noticed to be missing, if they are noticed to be missing at all.

Short Term Recommendations

Each staff member could be provided with his/her own access code. ICCROM should have a policy where staff members sign a contract that requires them to hand over ownership of research and work when they leave or retire.

Medium Term Recommendations

It is recommended that cameras be installed at the entrances of the Archive (first floor). A camera can also be placed at the main entrance to the kitchen. A further option would be to install an alarm system with motion detectors in the Archive with 24 hour response, which is activated after working hours. The door leading to the archive from the kitchen could be installed with a mechanism that allows the door to be locked once closed and which can only be opened from the inside of the archive thus complying with fire regulations.

Risk 3: Dissociation

Dissociation caused by not having the technology to view some of the film, videos and digital material

Most of the films have never been viewed and the content is not known. This due to the fact that ICCROM do not have the technology/equipment to view the films.

Short Term Recommendation

ICCROM should contact l'Istituto Nazionale del Cinema or other local institutions specializing in films to obtain equipment to view the films.

Medium Term Recommendations

The films can also be copied onto dvd. The dvd can be removed from the archives and moved to another storage area for security reasons.

Long Term Recommendation

ICCROM should be able to keep computers or machineries able to read the digital material, which is in the archive.

The recommendations concerning the three major risks identified are summarised in Table 11. Time frame and cost are considered.

		cold storage unit
	Films copied onto dvd. **Cameras at the entrances of the Archive** **Camera main entrance to the kitchen.** **Alarm system with motion detectors** **Door locked from outside but open from the inside**	
Frost-free refrigerator **Personalised access code** **Policy to hand over ownership** **Obtain equipment to view the films.**		**keep computers to read the digital material**
Short Term	**Medium Term**	**Long Term**

RED = More than 1,500.00 Euros
ORANGE = Between 200.00 and 1,500.00 Euros
YELLOW = Between 0.00 and 200 Euros

Table 11. ICCROM Archive's risk assessment – Time/Cost recommendations

The identification of some meanings of control was developped for all priority risks. Table 12. presents the ones identified for Risk 1: “Too high temperature”.

Agent of Deterioration: Incorrect Temperature **Risk:** Too high Temperature

Stage/Level	Location	Site	Building	Room	Storage Unit	Object	Policy/Procedure
AVOID	--------	--------	Insulation of the roof, Close the windows with shutters	Breakdown of the air-conditioning	Cool storage container	Cool storage container	Regular inspection, maintenance of the air conditional system
BLOCK	---------	Create shadow	Insulation of the roof, Close the windows with shutters	Windows and doors closed	----------	----------	Maximize insulation
DETECT	Forecast for the region	Forecast for the town	Measuring the response of the building to the temperature	Thermometer	Thermometer	Thermometer	Regular measurement
RESPOND	----------	----------	----------	Reduce temperature at least in one of the room, Increase ventilation,	----------	Remove objects and put them in a cooler space	Make possible that this risk will not affect new film material arriving to the archives acquisition
RECOVER	----------	----------	----------	----------	----------	Make copies	Cooping the originals

Table 12. ICCROM Archive's risk assessment – Determination of Meaning of Control for Risk

CHAPTER IV

CASE STUDIES

IV.1. INTRODUCTION

This Chapter presents case studies concerning various countries (Bhutan, Caribbean Region, Greece, Liberia, Madagascar, Peru, Russia, South Korea, and Venezuela) in various continents.
Different Agents of Deterioration (Michalski 2004) are considered: from fire, which is the most common one, to direct physical forces such as earthquakes and wars and pest.

Some case study develops preparedness phase's actions, while others take into consideration responses and others recovery's actions.

In none of the case studies the methods presented in Chapter III have been applied. This is because these methods are too "young" yet and because they are still in "testing". In addition to that, the disaster risk management methods applied to the cultural heritage field are not yet broadly and internationally diffused.

IV. 2. BHUTAN- FIRE DISASTER MANAGEMENT

The current situation in fire disaster management and prevention measures undertaken in Bhutan is here outlined. As in many other countries, there are several disaster factors in Bhutan, e.g. fire, earthquake, flood, landslide, and storms, with fire being the major enemy. The damage caused by flames is usually irreparable. Stolen and damaged goods can often be recovered and restored, but fire can eradicate priceless objects or entire buildings forever and in a remarkably short time.

Forest fires are a major problem for Bhutan with 72.5% of the country under forest cover and a series of fires breaking out in different parts of Bhutan every year, causing great loss to the kingdom, socially, economically and environmentally. The winter months in many parts provide perfect conditions to feed fires. When areas become dry and vulnerable, the fire gets out of control, invading the domains of flora and fauna at any moment.

Fires destroy edifices such as monastery-fortresses, buildings and houses, and a large number of monasteries and temples housing invaluable artefacts are scattered throughout the country, often in strategic places far beyond the reach of modern facilities. As all these structures are usually built of wooden materials which have dried and become brittle over the years, they are very vulnerable. In the event of fire there is little chance of survival for these venerated treasures. *Tagtshang* monastery was devastated by fire in April 1998, causing great loss to the country.

With the serious threat of fire every year, the Royal Government frequently holds training workshops on fire prevention to train fire personnel and raise awareness on the risk. With the limited resources available, prevention measures, emergency planning and safety exercises are held, with drills and tests. At present we are complacent and the task ahead is great indeed.

IV.2.A. Causes of Fires

A study of the causes was undertaken by the Fire Department which found that building and house fires were largely attributable to: defective heating systems, unsafe handling of flammable liquids and gases, faulty electrical wiring, careless smoking, insufficient emphasis on prevention and responsibility, lack of application of available fire-protection engineering

expertise, the increasing use of electrical installations which are potential sources of ignition , deliberate lighting of fires and negligence.

Forest Fires were mostly attributed to: fires being made near or inside the forest, careless disposal of cigarette butts, children being allowed to play with fire and deliberate lighting of forest fires to clear land to graze cattle.

Either through negligence or malicious intent, people is responsible for 99% of forest fires in the country. The trend becomes serious in winter when young students home on vacation are encouraged to collect firewood from the forests.

IV.2.B. Preparedness and Planning

The study reveals that while general training is offered, specific disaster preparedness or planning for disaster-prone sites have not been carried out either by individuals or the government. It is therefore highly advisable that fire-prone sites which house valuable property should have emergency and rescue plans, preparedness procedures (scientific procedures) to cope with emergency situations in the event of fire so as to avoid major losses.

Construction is currently underway on the archive building, beneath the National Library of Bhutan. When completed, it will be the only building in the country equipped with modern technical installations, i.e. it will have fire and theft security alarms, will be designed to withstand pressure and earthquakes, with built-in protection for the archive records in the event of theft, fire or flood, and a stable temperature and relative humidity to be maintained on the premises.

The Cultural Property Division of the Department of Culture trains caretakers of monasteries all over the country to deal with disaster situations such as burglary, theft and fire. The training is mainly in forward planning and warning, awareness raising and training of monks, organisation for and management of disaster situations, including preparation of operational plans. This addresses the immediate concerns of the Government.

IV.2.C. Prevention Measures

Certain types of disasters, such as floods, hurricanes, and earthquakes can sometimes be forecast, but destructive forces, such as fire and explosions, cannot be planned and avoided. However, by following preventive measures, it may be possible to avoid subsequent costly or fatal damage and prevent the disaster from turning into tragedy. Some of the Building/House Fire Prevention Measures tha are undertaken in Bhutan are:

- electrical installations made to meet appropriate regulations and standards
- issuing of public notices on the basic risks of fire
- keeping surrounding areas clean and free from flammable materials
- providing training in fire-fighting with the assistance of the local Fire Department
- ensuring that everyone is aware of the primary response in the event of fire, that being to inform the Fire Department
- installing fireproof (Methub) cabinets to protect valuable artefacts, e.g. in monasteries and temples.

One common task is to encourage everyone to help prevent forest fires which kill valuable flora and fauna and destroy the balance of the environment. Some of the forest fire prevention methods currently used in Bhutan are:

- fire-fighting training workshops for farmers, e.g. *Dzongkhag* (district) forestry sub-sectors, *Geog* (block) extension staff and territorial staff.
- designing fire prevention messages on signs and billboards for display in public areas and in fire-prone *dzongkhags*.
- producing and publishing fire-fighting training manuals, with technical assistance from fire experts (Australia: NSW, RFS) for distribution to all twenty *dzongkhags* and translation into *dzongkha* (the national language).
- producing jingles and messages to broadcast via Bhutan Broadcasting Services (BBS), television and *Kuensel* (national newspaper) during the fire season.
- designing and producing fire posters and pamphlets on fire prevention.
- being involved in study tours and training sessions outside the country.
- procuring fire-fighting tools/equipment for distribution to the *dzongkhags* for use.
- distributing approximately 45 radio-operated handsets to the District Forest Officers to help with reporting, patrolling and management.

IV.2.C.a. Traditional Fire-Fighting Methods

When fire occurs, a range of facilities may be needed to cope with the disasters. Although traditional items may not be as efficient as modern equipment, they can still be used to fight fires. Water can be poured on the flames using buckets or other containers; sand or soil can be thrown on the flames, in either a trail or sequence; sacks and cloths soaked in water can be used to beat the flames and reduce the intensity; leafy branches can also be used, and large groups of people and fire-fighting volunteers need to be called in. These methods may only be helpful in the initial stages, for once the fire is out of control, and they will be of little or no help at all. Modern equipment will therefore be needed, although this too will have advantages and disadvantages, depending on factors such as time and location.

IV.2.D. *Tagtshang* Monastery: Devastated by Fire

Tagtshang Monastery, a combination of history and sanctity, was founded in the 8th century by the great Indian Tantric Master *Padmasambhava*, and devastated by fire in April 1998. A nun who lived above the monastery was the first person to notice it. She called out, but the caretaker did not respond. The fire started in two different parts of the monastery complex at around 7 p.m. The flames did not spread for about half an hour, but the caretaker apparently made no attempt to save the precious religious artefacts in the temple.

Four men from the village below who were the first to reach *Tagtshang* said the heavy entrance door of the monastery was wide open, but they could not get inside because of the heat of the flames which had spread by then to all the temples. Other villagers joined them and, standing on the opposite side of the gorge, watched helplessly as the historic monastery was devoured by flames. The site was in a strategic position and had only one entrance which made any rescue efforts impossible.

After investigation, the Royal Bhutan Police suspected murder and arson in the *Tagtshang* fire. Evidence emerged showing that the caretaker had been killed and the monastery deliberately set on fire. The police found pieces of human bone believed to be the remains of the caretaker, by the door of his residence, at the top of a flight of stairs leading away from the monastery. The Royal Bhutan Police have announced a reward of 200 million Nu for any information leading to the arrest of the person or persons responsible for setting fire to *Tagtshang* Monastery.

Many lessons have been learned from the *Tagtshang* experience, both human and spiritual, revealing profound dimensions to the tragedy. The Tagtshang fire will be far more than a disaster for today's generation. The monastery itself was a remarkable feat of traditional Bhutanese architecture; some religious paintings and artefacts which were part of the religious heritage went lost.

More efficient security systems are needed and greater manpower to fight such disasters. The *Tagtshang* fire showed that more than one or two caretakers were needed. There are also other monasteries needing more caretakers and proper fire security systems. On reflection, the fire has woken up a large proportion of the Bhutan's younger generation, making them aware of the invaluable cultural and religious legacies we have, and also of the responsibility we have to safeguard them. Many Bhutanese citizens realized that they had never visited this holiest shrine.

Disasters can strike at any time. Emergency planning is therefore of paramount importance. There are a large number of outstanding monastery-fortresses and historic temples in Bhutan with virtually no fire security measures. Since fire is one of the major problems for Bhutan, it is needed to have security and emergency planning, and specifically adapted to Bhutanese traditional buildings and houses and the topography of the country so as to minimise loss of life and damage. It is needed to organise and facilitate timely and effective rescue, relief, and rehabilitation in the event of a disaster.

Many parts of *Thimphu* are rapidly filling up with houses, but precautions and insurance are not a priority. Proper and adequate infrastructure and facilities or the lack thereof are the major fire disaster management issues.

IV.3. CARIBBEAN REGION

Between the continents of North America and South America lies an arc of islands extending eastwards from just south of Florida in the USA, then curving southwards to the South American mainland. The roughly rectangular area enclosed by this chain of islands and bordered on the west by the narrow continuous land mass connecting the continents north and south is occupied by the Caribbean Sea. This Caribbean Sea lies atop a tectonic plate whose northern, eastern and southern edges meet the Atlantic, North American and South American plates respectively in an area of volcanic and earthquake activity which indeed explains the origin of the islands themselves.

On the other side of the Atlantic Ocean, in the same tropical latitudes of the Caribbean islands, hot easterly winds from off the Sahara in North Africa are heated further by the surface of an ocean exposed to the radiation of the sun which is more or less directly overhead in May-July. This gives rise to the cyclonic moisture-saturated air currents which hustle across the Atlantic each year from July to October, some of them bombarding the islands as well as Central America and the southern area of North America, as hurricanes.

It was in this part of the world that in the 16th and 17th centuries European explorers and adventurers first encountered then exploited different cultures, different environments to which other people, other fauna and flora were introduced in large numbers. There were profound impacts on the culture, economy, demography and ecology of the region. The legacies of this colonisation are everywhere. There is a distinctive Hispanic Caribbean, an Anglophone, Francophone, a Dutch Caribbean, and different forms of government and administration. At the same time there is a recognizable Caribbean culture – a syncretic but fluid combination of Africa, Europe, Asia and Native America. The social histories were similar, are shared; the geological history is the same; and the geographical realities – of location, sea, winds, temperatures, hurricanes, droughts, floods, etc. – are common to the entire region, albeit in varying degrees.

IV.3.A. Natural Disasters

The process of subduction of the North and South American tectonic plates beneath the Caribbean plate is continuous and gives rise, from time to time, to earthquake and volcanic activity. In historical times, Port Royal in Jamaica and Jamestown in Nevis subsided into the

sea and were destroyed with much loss of life in the late 17th century. In 1843 another big earthquake was felt throughout the islands of the Eastern Caribbean resulting in loss of life. There were several minor tremors throughout the years, with more severe activity recorded in 1974 and 1997. There are, likewise, volcanoes throughout the islands which act up every now and again; and there have been major eruptions, most notably the *Soufriere* volcano in St. Vincent in 1902–1903 resulting in more than 1,500 deaths, and the explosive eruption of *Mount Pelée* in Martinique in 1902 which destroyed the town of St. Pierre and its 28,000 inhabitants. More recently the *Soufriere* Hills volcano in Montserrat began erupting in July 1995 and still continues to pose a threat to the entire island. Two-thirds of the island lies in the danger zone and more than half the population have left. For most Caribbean people however, the most urgent threat is from hurricanes. These are seasonal, more predictable and, in recent years, fairly regular.

IV.3.B. Preparedness and Response

Volcanic and earthquake activity in the Commonwealth Eastern Caribbean is monitored by the Seismic Research Unit of the University of the West Indies which is funded by these former British colonies which now, except for Montserrat and the British Virgin Islands, are independent states. Close links are maintained with the French and Venezuelan agencies which monitor such activities in the French Caribbean Departments and Venezuela respectively. The Seismic Research Unit also monitors, under contract, the Dutch Antillean Islands.

The Caribbean Disaster Emergency Response Agency (CDERA) on the other hand, is concerned mainly with disaster response and management. There is a Regional Intergovernmental Agency of the Caribbean Community (CARICOM), an association of former British colonies in the Caribbean, now widened to include Haiti and Surinam. Each member state of CARICOM has its own disaster response agency, linked with each other through membership of CDERA.

There is no regional, nor indeed national policy or mechanism which addresses disaster mitigation and response for cultural heritage including monuments, structures and collections. Cognisant of this deficiency, the Museums Association of the Caribbean (MAC), comprising museums and related institutions throughout the region as well as museum professionals and other associates, has convened two workshops for its members in which professionals from

CDERA and other agencies have provided invaluable assistance. Out of these exercises, most museum members of MAC have put in place disaster mitigation and response strategies for their respective institutions. The training derived from this experience has been expressed several times since as one hurricane after another, accompanied in some cases by heavy rainfall, flooding and salt-saturated air, have battered the islands in recent years. An outstanding example of inter-island collaboration occurred when members of MAC secured the museum collection of the Montserrat National Trust which was threatened by the erupting volcano, and stored it for a time at the Barbados Museum.

In 2001 a one-week Caribbean and Central American workshop in risk management for cultural properties was held in Santo Domingo in the Dominican Republic. This important workshop was conducted by ICCROM. A follow-up workshop was held in December 2003 and in 2010 ICOM is planning to organise a training session under the framework of its Museums Emergency Programme.

Most of the Museums of the Caribbean are small, woefully under-funded, with staff strong on commitment but weak in training. Governments of the islands tend to spend little of their scarce resources on the preservation and protection of cultural heritage, and even private sector corporations prefer to support the more populist projects such as sports and festivals. Yet as we all know here, cultural heritage and its preservation and protection are of fundamental importance to national development. Many initiatives have been taken by non-governmental non-profit organisations in promoting greater awareness of the value of cultural heritage and in implementing measures to protect this heritage.

The earthquake that tackled Haiti in January 2010 remembers us of the vulnerability of this country where social and economic issues were already daily preoccupations even before the disaster.

IV.4. GREECE - THE RESTORATION OF THE ARCHAEOLOGICAL AND BROADER LANDSCAPE OF OLYMPIA

The following Case Study presents at first the causes and the circonstances that brought to the disaster of the fire of 26th August 2007. It is presented by different angles in a complementary approach. This permits:

- to identify the real threats to an archaeological site of the significance and value such as the World Heritage site of Olympia;
- to outline the research needs in many disciplines;
- to classify the quick response and recovery interventions implemented and the proposals for prevention actions;
- and to list the different entities that are to be considered as integral part of a disaster risk management plan.

IV.4.A. Presentation

The Archaeological Museum of Olympia (Fig.31.), one of the most important museums in Greece, presents the long history of the most celebrated sanctuary of antiquity, the sanctuary of Zeus, where the Olympic games were born. The museum's permanent exhibition contains finds from the excavations in the sacred precinct of the Altis dating from prehistoric times to the Early Christian period. Among the many precious exhibits the sculpture collection (Fig.32.), for which the museum is most famous, the bronze collection, the richest collection of its type in the world, and the large terracottas collection, are especially noteworthy.

Fig.31. The entrance of the Archaeological Museum of Olympia after the renovation in 2004. (© C. Menegazzi)

Fig.32. Hermes of Praxiteles. Made from Parian marble it stands 2,10m in height. It is thought to be an original and it is dated to ca. 330 B.C. (© C. Menegazzi)

The museum building comprises exhibition rooms (Fig.33.), auxiliary spaces and storerooms. The vestibule and twelve exhibition rooms contain objects excavated in the Altis. The auxiliary spaces (lavatories) are located in the museum's east wing; a separate building between the museum and the archaeological site houses a book and souvenir shop. Finally, part of the east wing and the basement are dedicated to storage and conservation of terracottas, bronze, stone, mosaics and minor objects.

Fig. 33. Exhibition room. (© C. Menegazzi)

The Archaeological Museum of Olympia, supervised by the Seventh Ephorate of Prehistoric and Classical Antiquities, was reorganized in 2004 to meet modern museological standards.

The renowned archaeological site of Olympia is found in twenty two kilometers southeastern from the town of Pyrgos, the capital of Ilia prefecture, at northwestern Peloponnesus in Greece, separated from the contemporary municipality of Ancient Olympia by the small river Kladeos over the Valley of Alpheios River.

Olympia is the place where the Olympic Games took place every four years in ancient Greece. Nowadays it is visited by thousands of people every year for the archaeological site and for admiring the precious exhibits in the archaeological museum. Every four years, in a ceremony held on the site, the Olympic torch is lighted here, starting a trip to the place where

the Modern Olympic Games are to be held. In 2004, when the Olympic Games were held in Greece, the ancient stadium was also used for some of the competitions.

The archaeological site is on a hilly location. The hills are covered by rich vegetation, mainly Aleppo pine (Pinus halepensis) forest, creating a beautiful and tranquil environment. Most of the area around Olympia, however, is covered by agricultural fields (Fig.34.).

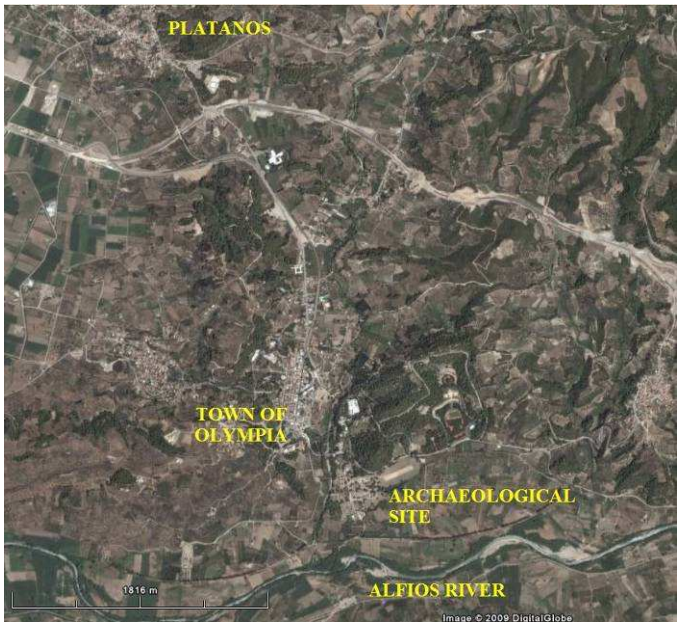


Fig.34. The town of Olympia and the area north of it on a satellite image taken from Google Earth.

On the summit of Kronios hill (Fig.35.) or Kronion, distinctive landmark of Olympia, where the cult of Kronos was practiced, one of the most important pan-Hellenic sanctuaries was created. With its famous Temple of Zeus, in Kronios hill lower slopes, Olympia rapidly developed into one of the most important religious and athletic centers.

Fig.35. Kronios Hill after the fire. (© C. Menegazzi)

The broader area of Ancient Olympia belonging to the Hellenic Ministry of Culture, has been characterised as "Special Area of Natural Beauty" included in the European Natura 2000 network while the archaeological site is, from the year 1989, in the list of the World Heritage properties.

The ancient Greek writers give us valuable information about the Olympic landscape in antiquity**.** Referring to the Sanctuary of Olympia, Pindar says "Oh, the beautiful forest of Pisa, by the river Alpheios". Lycias caracterises Olympia as the most beautiful place in Greece. Strabo says that the Stadium is placed in a grove of wild olive trees. Pausanias is clearer and refers to the many different kinds of trees that existed in Altis, cypress, poplar, plane and oak trees as so many others.

The worship of Zeus began in a grove, by the rivers of Alfeios and Kladeos and under the hill of Kronios. The pilgrims used to leave their votive offerings in front of the altars or hanged them to the branches of the trees. The name "Altis" was given by the aeolic word "grove" and comes from the verb άλδω which means feed. Altis was full of wild olive trees, plane trees, cypress trees, poplar trees, pine trees, oak trees, myrtles, willow trees and others. Near the temple of Zeus and by the Altar of the Nymphs, there was the wild olive tree from which they

used to cut a wreath, kotinos, the price for the winners at the Olympic Games (Vikatou, unpublished).

During the Games, people sprinkled the athletes with leaves and flowers. Many plants took their names from nymphs and heroes. For example, Iris, the messenger of Gods, the beautiful Narcissus, Adonis and many others. Between the trees of this beautiful forest the temple of Zeus and the other buildings of Altis were erected. The forest was composed by strong and powerful oaks, poplars of the sacrifice, myrtles (symbol of love), apple trees (symbol of wisdom, beauty and victory), vines, ivies, palm trees and of course the sacred olive trees, symbol of peace. The oak, cedar, cypress, myrtle and fig tree were used for the construction of wooden statues. The altars were decorated with ivy (symbol of immortality), wild carnations, lilies and roses. For the sacrifices they used poplar. The trees and plants were part of the famous Olympic landscape.

The travellers of the 19th and 20th century give us valuable information. They all refer to the beauty of the Olympic landscape, the rich vegetation, the high forests. The sketches they made of the Alpheios valley show that Kronios, at that time was not abounding with pines. It resembles to the image we face today, after the fire.

At the beginning of the 20th century the landscape changed. The archaeologist B. Leonardos, in 1901, describes the place full of many kinds of trees and plants: “Kronios was planted with pine trees, cypress trees, myrtles, plane trees, oak trees and others”. At that time, Kronios looked like the hill we knew before the big fire of the 26th of August 2007 (Vikatou, unpublished).

IV.4.B. Meteorological Conditions

Olympia has a Mediterranean climate, characterised by a prolonged period of drought, of about five months duration with high temperatures and very low rainfall. The mean annual temperature is 17.4 °C, with a minimum annual average of 10.8 °C, and a maximum annual average of 22.7°C.

The annual precipitation is 920.9 mm with an annual average of 99.1 rainy days. The seasonal course of precipitation shows that the winter is the wet season of the year (409.6 mm), with autumn following (325.1 mm). During the spring, precipitation is less (158.8 mm), but

summer is the driest period of the year (27.4 mm). Bioclimatically the region of Olympia is semi thermo-Mediterranean type with a wet bioclimatic floor and mild winter.

During the summer of 2007, the temperature conditions prevailing in the area were significantly different from the average climatic conditions. The summer period (June to August 2007) a sum of 15.4 mm precipitation was recorded in a short two-day period in June. July's and August's 2007 precipitation was 0 mm. The high temperatures (minimum, mean and maximum) of summer and especially its mean values of August, lead to extremely dry conditions in the area. The absolute maximum summer temperatures were the highest ever recorded having values of 39.4, 43.0 and 42.2 °C, in June, July and August, respectively. The 25-year period before, those values were lower: 37.2, 42.4 and 41.0 for June, July and August, respectively. Wind speed values for the summer 2007 period were higher (5.97 knots) compared to the average conditions (4.9 knots), contributing further to drought. These meteorological conditions had a significant effect in the extensive damages, caused by forest fire in the area.

IV.4.C. Response Measures

The great fire which was burning for many days destroying houses, fortunes, and vegetation soon reached Olympia. In just a few minutes time it destroyed the Olympic landscape, the hills around the Archaeological Museum, the hill of Kronios, Academia and the Coubertin Monument. Thanks to the fire department and the change of the wind, the fire stopped by the bank of the river Kladeos and the southern end of the Archaeological site (Fig.36.).

Fig.36. Kronios Hill burning. (© O. Vikatou)

IV.4.C.a. Description of the fires developments

A series of large fires started on August 23, 2007 in many parts of Peloponnese, Greece, and within five days burned more than 150.000 ha of forests and agricultural lands. The fire season of 2007 in Greece was the worst in recent history as it set new records in regard to damages and loss of life. A total of seventy eight people, mostly civilians, lost their lives. More than 270,000 hectares of vegetation burned and more than 110 villages were affected directly by the fire fronts. Many hundreds of homes were totally destroyed while many others were seriously damaged. The worst fires occurred in Peloponnese, in just five days, starting on August 23. On that hot day two fires that started on Mount Parnon and Mount Taygetos in south Peloponnese were not attacked effectively (Fig.37.). On the 24th of August the conditions became worse as the high air temperature and low relative humidity were combined with a strong northeast wind. Those two fires started growing quickly while a new fire starts in the prefectures of Laconia, Ilia and Arcadia became large, growing fast in deadly conflagrations in a matter of minutes. More than 35 people were killed by the flames on that day. The spread of the fires continued on the 25th (Fig.38.) while the fire fighting forces, overwhelmed by the fierceness of the fires and the news about the deaths, did little to control the blazes, concentrating their efforts on evacuating villages and saving individual properties. Among the fires that expanded rapidly that day there were two fires that had started on the 24th near the villages of Valmi and Klindia north of Olympia and merged into one. The potential danger they meant for Olympia was not recognised at the time.

Fig.37. The fires of August 23, 2009, in the morning, in Peloponnese. Source: NASA

Fig.38. The fire situation on August 25th. The fires of Valmi and Klindia are clearly visible north of Olympia.

High fire danger conditions continued on the 26th of August as the wind changed direction and started blowing from the northwest. The Valmi-Klindia fire started spreading in a southeast direction developing two fronts (Fig.39.). The first front, reaching the village of Varvasaina early in the afternoon, attracted a lot of attention by the fire fighting forces. A little later, the second front advanced to the village of Platanos about 3.5 km northeast of Olympia. Even then, in spite of warnings by many local officials, the threat to the archaeological site and the museum was not clearly recognised by the fire fighting authorities that had been receiving numerous calls for help from various sources, and seemed confused and without a concrete plan of action. After passing the village of Platanos, where it left two dead persons, the fire moved quickly and aggressively towards Olympia burning a mix of pine stands and agricultural fields (Fig.40.). Fine fuels in the latter made its spread very rapid. This quick spread left no time to the fire fighting forces to regroup and to try and defend the site in a coordinated way taking advantage of the existing roads.

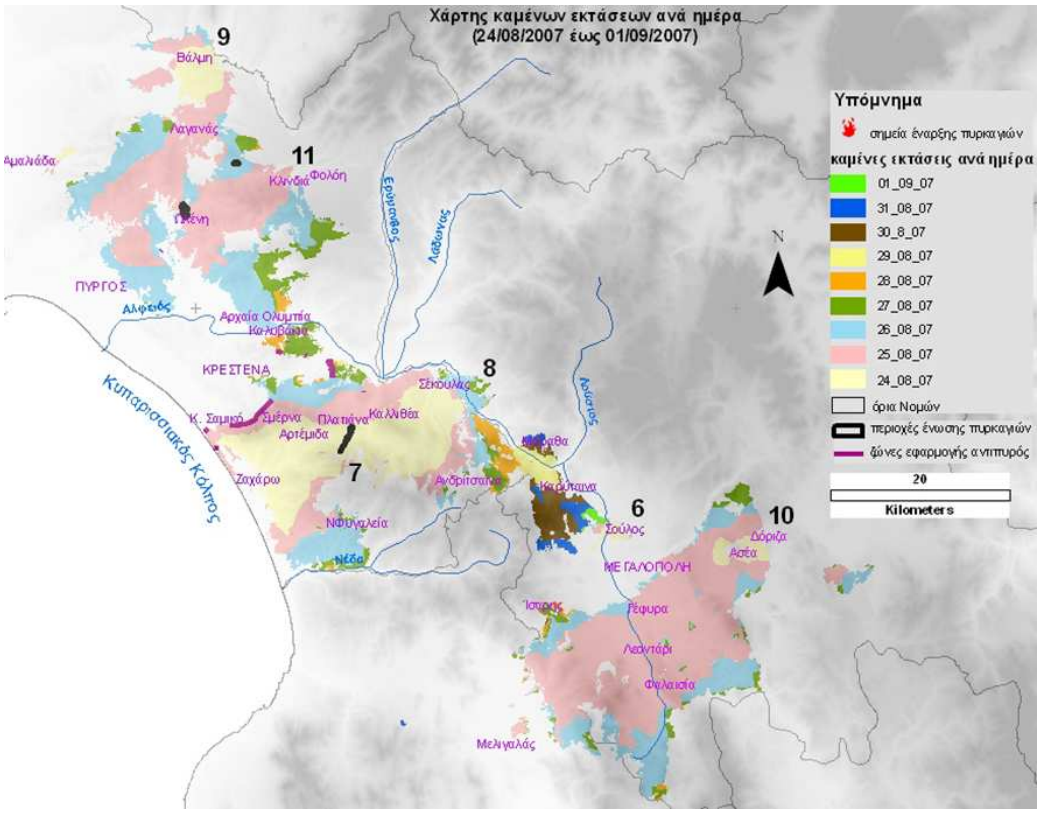


Fig.39. Daily evolution of the fires in western Peloponnese between August 24 and September 1, 2007 (© Athanasiou 2008).

The fire first hit the outskirts of the town of Olympia where visitors of the ancient site had found refuge. As buildings in Greece are built mainly with non-flammable materials, there was no real threat to lives and only few homes were damaged. Many TV station reporting crews and photographers were already located in Olympia and documented like the fire spread (Fig.41.) and the lack of significant fire fighting resources at that moment.

Fig.40. The fire approaching the town of Olympia from the north (© O.Vikatou)

Fig.41. Pictures from the fire front passing through Olympia (top) and entering the archaeological site (bottom) as reported by the Mass Media

A few minutes later, as the fire entered the archaeological site additional ground resources arrived, including a specialised fire fighting tank. They were helped by helicopters and amphibian Canadair aircraft which, at that time, started making water drops from the air. In a last minute effort of the fire-fighters, of the aerial resources and of the personnel of the Archaeological Service, the damage to buildings and the other historic elements of the site was minimised. The effort also resulted in stopping the fire at the south edge of the site, taking advantage of Alfios river and the agricultural fields there (Fig.42.). However, significant damage to the site was already done at few secondary buildings, most of the vegetation in the area burned, and a number of archaeological monuments were affected. The archaeological museum and the main buildings of the Olympic Academy were not damaged (Fig.43.).

Fig.42. The final perimeter of the fire showing that the front was controlled immediately after it passed the road (yellow line) that crosses the archaeological site. The fire also spotted on the opposite side of Alfios river but was controlled before spreading too much (© SERTIT - Service de Cartographie Rapide).

Fig.43. Aerial photo of the burned archaeological site of Olympia. The museum can be seen at the left edge, the installations of the Olympic Academy in the middle and the stadium at the bottom of the photo.

It should be noted that an automatic sprinkler system that had been installed on the site a few years before the disaster (Fig.44.) did not operate fully due to an electric malfunction. It was intended to wet the vegetation and not to extinguish a fire. Under these circumstances it did not contribute much to the protection of the site.

Fig.44. A photo of the sprinklers that had been installed in Olympia, in operation (© Dimitrakopoulos).

IV.4.D. Recovery measures undertaken

Considering that fortunately no major damages happened to the archaeological remains and to the museum themselves the recovery measures concerned principally the archaeological site area, its landscape and the reconstitution of the flora. It is interesting to note that in this specific case most of the attention was given to natural coutryside as part of the "picturesque Olympic Landscape". The restitution of the Olympic atmosphere given by its vegetation surrounding the archaeological remains was fundamental for re-establishing the enjoyment of the peaceful tourists' visits (Fig.45.).

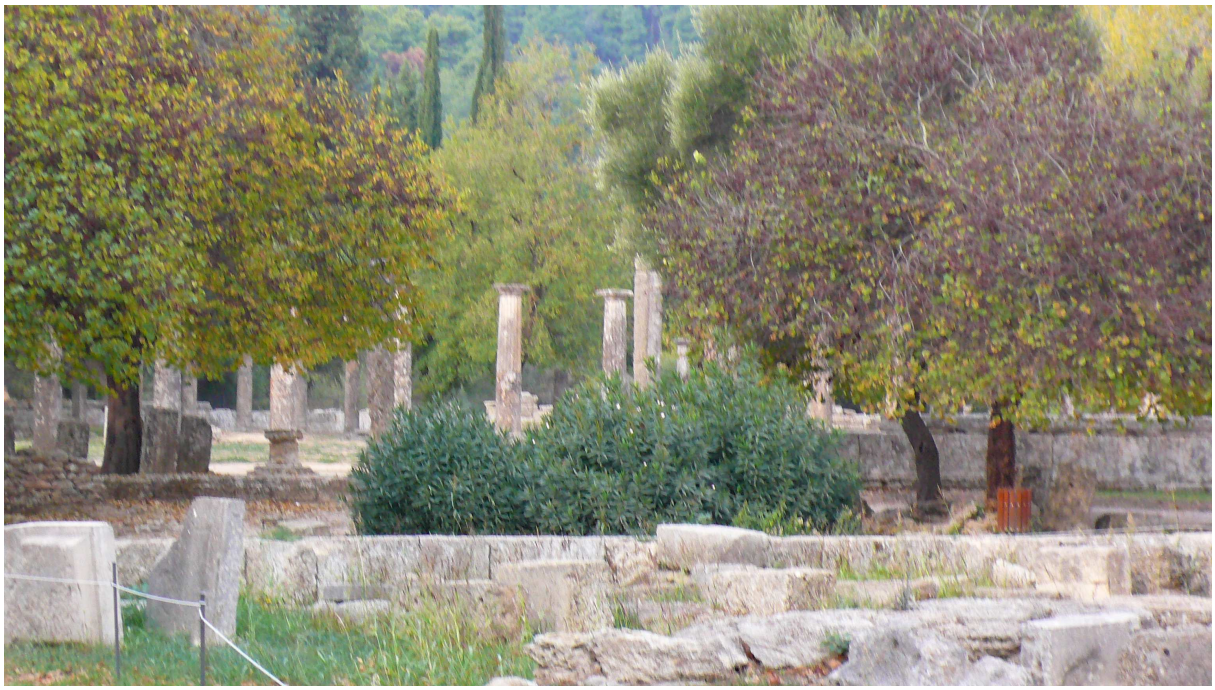


Fig.45. Olympic Landscape (© C. Menegazzi).

The reconstitution has been undertaken after adecuate monitorig and respecting the local taxa. Modern techniques and supports have been used completing a historical research. The best possible conditions have been reached by introducing mitigation actions in order to avoid the loss of vegetation, which is a vital component of the whole site, in another fire.

Immediately after the fire, the main and primary objective was to restore the archaeological site and to ensure that Olympia recovers its natural beauty. More precisely, the aim of Olympia's landscape recovery measures -characterised as "national goal", because of the strict timetable imposed by the very specific date (March, 24th, 2008) for the ceremony of the Olympic Flame for the Beijing Olympic Games of 2008 - was the embellishment of the place

with immediate measures and interventions for the protection of the soil against erosion and floods and its restoration of the vegetation through plant establishment with particular emphasis given to the maintenance of the Kronios hill geomorphology.

The restoration project focused mainly on the hilly area (Kronios, Zouni, Kalosaka, Inomaos hills) and the area of the International Olympic Academy surrounding the archaeological site covering about 60 hectares.

IV.4.D.a. Soil erosion and flood mitigation measures

From the various measures taken in burned areas for the protection of soil from erosion and the mitigation of floods in the lower parts of the area affected by fire, the log erosion barriers were selected. The log erosion barriers were constructed from the trunk of burned Aleppo pine and cypress trees and they were fixed parallel to the contours of the slopes of the hills. The aim of these works was: to shorten the length of the slopes; to increase the surface roughness; to increase the infiltration rates of the soil; to trap surface runoff and sediment and to improve the location behind the log barriers for the recovery of vegetation. This measure was selected because wood was considered as the appropriate material for the fulfillment of archaeological, historical, aesthetic, ecological, environmental and mainly protective requirements of the area.

The length of the log barriers varied from 0.50 to 2.00m and their diameter from 0.15 to 0.25m. They were secured on wooded stakes forming, as was mentioned, lines parallel to the contours from 1.00 to 3.50m apart from each other. This distance was determined according to log characteristics and also to topographic and hydro-meteorological conditions of each site they secured. The log barriers formed continuous or empty-space lines for better fulfillment of aesthetic requirements of the area. They also placed in a “mosaic design” consisting from single or double in height logs (one over the other) according to the gradient of the slopes The total length of the constructed works was approximately 115,000 m.

IV.4.D.b. Gully and small stream channel check dams

In the past, severe erosion and landslides occurred and formed a number of gully and small stream channels in the hills of the area. These sites could not be protected from further deterioration by log barriers and so logged check dams were constructed into them. The aim of the check dams was: to protect the channels from further erosion, deepening and widening;

to trap sediment or land masses moving down from the above sites; to decrease the risk of new landslides initiation; to improve the site behind the check dams for planting trees or shrubs.

Wood-made check dams were selected for the same reasons concerning the log barriers. They were also temporary constructions and were built perpendicularly to the main channel of the stream or the gully. The construction cross-sections of these works were selected according to their morphological and hydro-geological characteristics. Twenty five check dams were constructed in the rehabilitated area.

IV.4.D.c. Post fire natural regeneration

Mediterranean pine forests are well distinguished from the other ecosystems due to the considerable hosted plant and animal biodiversity, the climate conditions (dry and hot summer, mild and humid winter) and particularly their adaptation to wildfires. Aleppo pine (Pinus halepensis) has developed several adaptation mechanisms against fires. It is an obligate reseeder (regenerated only by seeds) and the mature trees usually die during the fire. The Aleppo pine survival depends on the annual production of mature cones and seeds, as well as on the maintenance of a large fraction of the annually produced seeds in the closed cones (canopy seed bank). The closed and mature cones (in unburned forests) are accumulated in the canopy seed bank, which is constituted by cones of various ages. An important parameter for evaluating the pine post fire forest regeneration is the burned stand age, which is directly associated with forest productivity in cones and seeds, respectively. In the area, the burned Aleppo pine stand age fluctuated from 40-80 years old and the forest constitutes of mature trees, with a mass of reproductive structures (cones) in its canopy seed bank.

In the framework of the Olympia recovery measures, the monitoring of the post fire Aleppo pine regeneration was achieved in four established experimental plots (10 X 1m^2) during the first post fire year (2007-8).

In the burned area, many post fire regenerated plant species (Quercus sp., Pistacia sp., Asparagus sp.) are already present (field measurements by the end of September 2007). It is noteworthy to mention, that no pine seedling was recorded at the same time in the experimental plots (September 2007), a fact that is strictly related to the onset of the first post fire rainy season in the area.

IV.4.D.d. Revegetation establishment by hydro seeding

Quick revegetation establishment by hydro seeding technique was a direct dynamic intervention applied to the broader archaeological site of Olympia following the big fire of 2007. Apart from the direct aesthetic result, it usually constitutes a first priority activity in inclined slopes for their protection from soil erosion but also in complementarity with the other soil erosion prevention measures.

Hydro seeding technique was not applied to the total burned area but only to 21 ha and mostly on the steep slopes with the following mixture (Albaladejo Montoro et al. 2000):

Water	20 m3/Ha
Fertiliser N:P:K 6:48:6	400 Kg/Ha
Glue	10-170 Kg/Ha
Fibre wood	1800 Kg/Ha
Organic soil improver	400 kg/Ha
Seeds	200 Kg/Ha

The mixture of the used plant taxa seeds was (Albaladejo Montoro et al. 2000),:

Lolium rigidum	15%
Phacelia tanacetifolia	15%
Sanguisorba minor	20%
Onobrychis sativa	18%
Medicago lupulina	18%
Plantago lanceolata	7%
Achillea millefolium	7%

Hydro seeding with the particular technology of the machinery used and with the help of hosepipe reached the 120 metres in length and at 90 metres elevation difference.

In the cases where the slope was particularly steep (an area of 3ha), a kind of geotextile, the jute, was used in order to cover the soil before the application of hydro seeding. In some cases the jute was applied even between log erosion barriers. The jute that was used is manufactured 100% from plant materials and it is biodegradable in 4 years time. Its role is

double: it retains and protects the surface of the soil and provides favourable micro-environment for the plants because of humidity retention and shading. Jute was fixed with metal biforcates and for better contact with the soil, smoothing the top of the slope was needed, so that there were no gap between jute and the soil.

IV.4.D.e. Plant establishment

The objectives of the post fire recovery activities in the archaeological site of Olympia were the re-establishment of the ancient oak forest based on Xenophon, Theophrastus and Pausanias references and the long-scale broadleaved species introduction and the locally replacement of Aleppo pine forest with a mixed forest for fire prevention.

Taking into account the Hellenic Central Archaeological Council's limitations, an authority responsible for any archaeological site management in Greece, the specific recovery measure has considered the following principles: the plant selection (selection of planted taxa) should follow the historical perspective of the site, utilise physiological fire resistant species and provide the paramount landscape aesthetic values; the optional planting of big trees that will narrow the burned landscape image at the ceremony of the Olympic Flame for the Beijing Olympic Games of 2008; the specific emphasis was given on Kronios hill geomorphology maintenance, due to the proposed infrastructures for fire prevention and the surrounding area of the New Archaeological Museum should be aesthetically restored as soon as possible.

Moreover, the selected plant species should be vigorous and not infected by insects or fungi. The plant material should be supplied from the broader region of Peloponnese nurseries, in order to maintain the local plant genetic resources and preserve the biodiversity. In addition, the high risk of erosion observed in the broader area, combined with high slopes (>60-70%) decrease considerably the success of planting works. Furthermore, an irrigation technique was a necessary forecasted action. A specific plan for plant establishment was applied for each hill, using the form, the colour and the height of the plant species, according to their environmental needs, for the design of the desirable landscape. Nevertheless, the aesthetic and functional re-establishment of vegetation will require enough time, while the broader area should be managed as a high biodiversity spot due to the valuable existing archaeological monuments.

Apart the re-vegetation establishment of the area by the hydro seeding technique, further plantations have been designed as follows: dynamic plantations of higher plants for ornamental purposes in visible areas from the archaeological site, the museum, the International Olympic Academy and the monument of Pierre de Coubertin; further reforestation, mainly on the hilly burned area, used 26 different plant species, as referred below, which were recorded in natural non-adjacent burnt region; special cultivating care of the natural post fire regenerated plant taxa.

Tree species	Shrubs species
Valonea oak (Quercus ithaburensis ssp. macrolepis)	Hawthorn tree (Crataegus monogyna Jacq.)
Pubescent oak (Quercus pubescens Willd.)	Turpentine tree (Pistacia terebinthus L.)
Holm oak (Quercus ilex L.)	Mastic tree (Pistacia lentiscus L.)
Kermes oak (Quercus coccifera L.)	Flowering ash (Fraxinus ornus L.)
Upright cypress (Cupressus sempervirens L.)	Smoke tree (Cotinus coggygria Scop.)
Cretan maple (Acer sempervirens L.)	Strawberry tree (Arbutus unedo L.)
Olive tree (Olea europaea L. var. europaea)	Greek Strawberry tree (Arbutus andrachne L.)
Olive tree (Olea europaea L. var. sylvestris Brot,)	Sweet-scented oleander (Nerium oleander L.)
Judas tree (Cercis siliquastrum L.)	Chaste-tree (Vitex agnus castus L.)
Umbrella pine (Pinus pinea L.)	Myrtle (Myrtus communis L.)
White poplar (Populus alba L.)	Spanish broom (Spartium junceum L.)
Laurel tree (Laurus nobilis L.)	Alaternus (Rhamnus alaternus L.)
Jasmine box tree (Phillyrea latifolia L.)	Jerusalem sage (Phlomis fruticosa L.)

Table 13. Plants used in the re-establishment of the Olympia landscape. (© Albaladejo Montoro)

All plant species, planted either in growing season of 2007-2008 or 2008-2009, are presented in Table 13. Totally, more than 39.000 plants were planted, from which about 3.000 of aromatic shrubby vegetation of the area were used in the Museum's garden.

IV.4.D.f. Future monitoring and maintenance of the area

Further study of the restoration measures undertaken is needed to prevent any change of the situation achieved in the area. Hence, in the framework of the Olympia restoration project and at least for its duration 2007-2012, a network of plots has been installed to monitor and investigate: the meteorological conditions of the studied area, mainly the rainfall and the temperature; the effectiveness of the specific design of the log erosion barriers for the protection of the soil from erosion and floods; the post fire regeneration of Aleppo pine in order to secure the reforestation priorities applied in the broader area; the estimation of the plant establishment, mainly the plant survival and growth.

Regarding the maintenance of the area and according plan of restoration, additional planting was provided for autumn 2009. The number of additional plantings, for the following years, will depend on the success of the natural regeneration and the survival of established plant species. The management also of flammable biomass has been foreseen to prevent new fires. Additionally, special cultivating care and irrigation of the established and of the natural post fire regenerated plant taxa is needed. The number of irrigated plants depends on the following dry summers, at least for the installed plants in winter 2008-2009.

The various measures taken for the protection of soil from erosion and the mitigation of floods combined with the vegetation establishment by hydro seeding protected effectively the whole burnt area and ameliorated significantly the broader landscape.

The burnt area, two months after the fire, was immediately filled with wild flowers and the natural regeneration of Aleppo pine gave the hope and an optimistic message that Olympia was already starting to recover. Also, as expected, the natural regeneration of evergreen broadleaved was highly satisfactory. It is noteworthy to mention, that the plantation established, except in certain positions where additional interventions were needed, is estimated to have been successful over 95%. Apart from the restoration of the archaeological and broader landscape of Olympia for the embellishment of the site, further objective should be to forestall and minimise as far as possible any future risk mainly caused by fire, which is a natural factor of hazard in the Mediterranean environments. However, in such areas, general management strategies should be as follows: any intervention should strive to be continuous and moderate, without irreversible changes to the natural and cultural environment; management should maintain landscape complexity and diversity by conserving the

abundance of ecological and cultural landscape units and new structures should respect local styles taking into consideration the natural and anthropogenic environment, surrounding the archaeological site, the historical references and to avoid violent display.

IV.4.E. Considerations and Proposals of Disaster Risk Management

The fire of Olympia highlights a number of issues about the potential for such disasters in sites of archaeological or cultural importance with similar characteristics to those of Olympia.

In a monument such as Olympia, surrounded by flammable Mediterranean vegetation, a wildfire every few decades is more than just a probability. It is a certainty and it must be seen under this light. Increased protection by local firefighting forces may be enough to control small starting fires, but roaring mega fires coming from a distance can defy all firefighting efforts at their front and can sweep the site with disastrous results. Furthermore, the case of Olympia illustrates that under such extreme conditions, further compounded by deaths, a temporary collapse of command is a possibility that cannot be ruled out. Then, a preferential external effort to protect the site may be absent when most needed, and the whole effort may have to rely solely on the local people, resources, infrastructures and plan.

Mega fires, as a rule are not a common event. As a result people tend to forget and the emphasis given to the preparation for such an event decreases with time. However, this should not be an excuse for a highly visited site of great importance. Adequate planning and provisions should always be in place to secure the safety of the monument and of the visitors even when a large fire reaches its perimeter. In light of the above, each monument with similar characteristics to Olympia must have a high quality fire management plan that outlines actions in regard to fire prevention and suppression. The plan must be prepared by highly specialised experts in cooperation with all the local authorities and groups that will be involved in its application. These authorities will introduce in the plan the special limitations that need to be considered, such as archaeological considerations, and will also offer ideas and solutions.

The plan should:

- Foresee scenarios for fires starting within or near the perimeter of the site, and for large fires coming from a distance.

- Identify specific weaknesses, such as construction materials of certain buildings, outlining measures to be taken for risk mitigation (materials removal or replacement, extra protection, etc.)
- Include a firefighting infrastructure design, including water transport system, hydrants, sprinklers, and other tools, appropriately allocated on the site, and able to function under adverse conditions. For example, there should be backup for the lack of electricity, redundancy of critical components, etc.
- Provide guidance for vegetation management in order to keep fuels under control. Furthermore, it should foresee gradual enrichment of vegetation with less flammable species that will also improve the aesthetics of the site. It should be noted that certain options, such as construction of wide firebreaks, may not be an option of such sites for practical (e.g. land uses, ownership) or aesthetic reasons.
- Include a plan of action for the safety of the visitors, identifying or developing safety areas while taking into consideration the adverse conditions (e.g. smoke, low visibility, panic) at the time of crisis.
- Provide for the training of all the personnel involved (archaeological authority, firefighters, local authorities, seasonal personnel, etc.) including familiarisation with the plan.
- Provide information to the neighboring population about the potential for disaster and the actions they can take to reduce it. Practical guidance and help are among the tools to be used.

IV.5. LIBERIA-PRESERVING THE ENVIRONMENT AND LOCAL TRADITIONS

To analyse adequately and share the concerns of the experience as outlined in this case study the emergence of the Liberian conflict disaster situations and the preparedness and response is developed as follow:

1. the background linking the local history to the emergence of man-made disasters.
2. the role played by heritage personnel and institutions such as museums in preserving the environment and local traditions.
3. the Liberian experience in terms of disaster preparedness and response related to the preservation of the environment and traditions.
4. an attempt to outline some of the challenges facing Africa (and Liberia in particular) in the area of natural and cultural heritage protection and preservation.

Unlike all other African countries, Liberia was never ruled by a foreign government. It was founded by a group of philanthropists called the American Colonization Society. Two hundred years later the first Africans were transported to America against their will, and their descendants sailed back to the land of their ancestors. The resulted was that thousands of freeborn Blacks and former slaves sought to find a suitable place where these free Blacks could settle. This led to the settlement along the West African coast and eventually to what is now known as the "Land of Liberty" (Liberia). Liberia's growth from a "colony" to a modern state was not without challenges, especially its attempts to integrate settlers and early tribesmen in the hinterland of some 43,000 square miles. But nothing has upset and frustrated Liberians more than the country's devastating civil war which began on December 24, 1989 and has lasted for the past years

IV.5.A. Role of the Museum

In Sub-Saharan Africa, in particular the West African Region, museums were constructed by colonialists interested in the exploration of conquered or colonized lands. Their policies and programmes reflected their views and interests on what and how the history of the region should be documented through educational institutions and museums; these were presented in an artistic rather than a functional manner. Even today researchers continue to invade West Africa, while collectors, dealers and tourists are said to be interested in "Airport Art". Their activities have caused dramatic and sometimes tragic erosion of the original spiritual and material culture of the sub-region. Following the independence of these colonised States, their

leaders used museums and sites of cultural value as instruments to promote African Unity, in most cases, national unity to serve their geopolitical plans and also the need for enhancing the culture of peace. The National Museum of Liberia was established in 1958 by an Act of the National Legislature, the primary goal being to collect, preserve and display the country's cultural artefacts and other historical items. During this early period, Liberia could boast of having one of West Africa's most modern and lively museums. The museum was also responsible for regulating, coordinating, documenting and protecting other natural/cultural sites and for encouraging local traditional values, folklore, movements and customs. This level of achievement was interrupted by the series of battles for the city of Monrovia which destroyed the very fabric of society, not to mention infrastructures such as the Museum building and its contents. However, people begun to put the pieces back together by establishing a support arm called the Association of Friends of the Museum of Liberia and a vigorous reorganisation and revival of the entire undertaking.

IV.5.B. Conflicts and Emergencies in Liberia

A major phenomenon in the emergency situation experience in Liberia has been the case of violent inter-ethic fighting between settlers and tribesmen on the one hand and the quest for land on the other. The spirit of brotherhood and sympathy meant natives sold the first strip of land to settlers (pioneers) on Providence Island (1821), and helped foster communications and trade. However, these relationships did not last long. In the words of one of Liberia's historians, Mr. Karnga[1]:

> "this was the history and start of all subsequent wars between pioneers and natives. Apart from demands for the slave trade, colonialists had always been sceptical about the black (African) man's ability to acquire knowledge and political independence, and so they left no stone unturned in their bid to cause discord and confusion between the pioneers and indigenous people, giving the appearance that the indigenous people of Liberia had no interest in self-government and authority."

This trend continued most of the time up to the independence of Liberia on July 26, 1847. The country consolidated its gains among the community of nations, but problems of encroachment on its borders, internal tribal hostilities and other forms of violence persisted up

[1] In Nyewan 2003.

to the 1920s when the situation settled, leaving relative peace that characterized Liberian statehood until the country was again plunged into another circle of violence, beginning with the "rice riots" of 1979 and continuing to the civil war in 1990. This period of man-made disaster saw a disproportionate level of wanton destruction, human suffering, and misery, with displaced persons and even deaths. Our infrastructures and natural and cultural heritage felt the brunt of these crises. There had been other disasters in Liberia such as floods, landslides, erosions and outbreaks of fire, but these were rare occurrences, warranting a limited response in terms of relief strategies, time, attention and cost. The principal and first-hand response comes from the communities, local inhabitants, non-governmental bodies operating in Liberia and, at times, the central government.

Since armed conflict dominates all emergency situations in Liberia, the concerns have been on developing preventive and integrated solutions to address the causes such as bad governance, mismanagement, ethnocentricity, power and leadership struggles, illiteracy, poverty, and the competition for land and scarce economic resources. While conflict itself can be defined as a state of disagreement or argument between people, groups or countries, it is a universal human experience whose origin and nature are best explained with the framework of human nature and the environment in which man lives. It has the propensity to affect people and cultures across boundaries, thus prompting the need for collective concerns and approaches in averting, minimizing or eliminating it. It is about time that those of us in the cultural and environmental arena showed a close and careful interest in the security, management and protection of our natural and cultural heritage by implementing the 1954 UNESCO Convention for the protection of cultural property in the event of armed conflict as well as the 1972 UNESCO Convention concerning the protection of World Cultural and Natural Heritage[2]. These instruments are definitely the bases and cornerstone of heritage protection.

[2] See the bibliography and the web link. for reference.

IV.5.C. Environment and Local Traditions

While it is true that so many conventions and groups are involved in the preservation and conservation of the environment, it is only positive actions by stakeholders that will make the difference. Yet the task of achieving a clearer, healthy and productive environment in Liberia is being hampered by continuous armed conflict, poor maintenance of culture and other socio-political issues, inhibiting the attempts to preserve the environment properly in all its forms, natural, cultural and human.

Cultural and natural heritage must be seen priceless and irreplaceable possessions, not only of one nation, but of mankind as a whole. The loss through deterioration or disappearance of any of these most prised possessions impoverishes the heritage of all the peoples of the world. Parts of this heritage, because of its exceptional qualities, can be considered to be of outstanding universal value and, as such, worthy of special protection against dangers which increasingly threaten it. It follows therefore that it is absolutely essential for any country caring for its heritage to do its best to protect both the natural and cultural environment and the objects emanating from or associated with them. Liberia is blessed with very rich cultural and natural heritage, with sacred sites of religious and spiritual importance, cultural and tourist attractions including natural settings such as mountains peaks, rivers, lakes, forest reserves, islands, mysterious rock formations and the coastline, plus a wide variety of flora and fauna, with wildlife and plant life in one of the world's largest rain forests. All of this heritage can only be protected if a concerted effort is made involving the local communities where these heritage sites are located, public education and awareness programmes, financial support and fully trained and experienced manpower to address the issues arising from the mismanagement of our cultural and natural heritage. New organizations are sprouting up in Liberia and are engaged in advocacy, protection, conservation and awareness of stakeholders and the public covering practices and trends in heritage preservation, particularly in disaster and emergency situations.

IV.5.D. Protecting Local Traditions

Traditions are the way of life, customs and beliefs of a people, handed down from one generation to another. Changes which in other continents took centuries are taking place overnight in Liberia. The social way of life is greatly threatened by those who want economic development. Museums in Africa have a pivotal role to play in balancing the need for social

and economic change and the protection of these rich traditional values by recording what has happened and what is going on now so as to impress upon individuals the importance of social and economic development. Liberia, with its mixed ethnic, religious, social and political make-up, has brought together the values, beliefs and practices of the indigenous communities, settlers and other groups from diverse areas such as the former empires of Africa, Southern America and the western hemisphere-the Caribbean.

Traditional and Western lifestyles exist side by side. Although most of the indigenous values are disappearing because of western influence, conflicts and war, social and religious breakdown, educational inadequacies and the general disregard for law and order and constitutional authority, many of the earlier values, movements and behaviour patterns are still cherished and respected as a means of maintaining a storehouse of both oral and written traditions. What are the positive attributes to be obtained from such acculturation, and how can they be used for the benefit of society and in return bring pride and national identity to the people?

IV.5.E. Disaster Risk Management

Disaster is any unforeseen event that might result in tragic loss of lives and property, be it natural or man-made.

By definition a disaster is a serious disruption to the functioning of society, causing human, material or environmental losses beyond the capacity of the affected society to cope using only its own resources. Vulnerability to disasters is a state due to human action with inherent situations such as poverty, ignorance and disease; it describes the degree to which a society is threatened by the impact of natural hazards. This degree depends on the condition of the human settlements and infrastructures, the way in which public policy and administration are engaged in disaster management, the level of information and education on hazards and how to deal with them and other aspects. To understand the concept of disaster reduction and preparedness it is necessary to learn through concrete examples, seeing what to do at local, national, regional and international levels to build a “safer world”. The negative impact of natural and man-made disasters and the related environmental and technological consequences are increasing, mainly through the correlation of rapid population growth and poverty in disaster prone areas. In Liberia, disaster prevention and preparedness, which involves the outright avoidance of the adverse impact of natural and man-made hazards on the

environment, is a possible first solution to the problems in this area. Preparedness, which actually encompasses measures taken in advance to ensure effective response to the impact of disasters, includes effective evacuation infrastructures and strategies that must be applied and, once it is developed a regular testing of early warning systems. Paradoxically, Liberia tends not to use such methods and procedures to address disaster situations because ready-made evacuation facilities and early warning equipment do not exist in the Liberian context. People are usually quick to react through physical mass movements to avoid the repercussions of disasters and these people are often forced to live in the forest, while the forests themselves are being depleted by uncontrolled logging and the development of new villages, towns and cities (Nyewan 2003). While the provision of funding, equipment and technical advice for disaster mitigation and reduction may not be a lasting solution, it is believed it could indeed help make would-be policy makers aware, first showing the dangers and risks posed to the local people and heritage and developing a comprehensive approach and methodology to be integrated into development or economic planning and programmes.

The prevention of disasters (natural or man-made) is set to play a prominent role in global efforts to reduce human suffering and damage to natural and built environments. Disaster reduction is both possible and feasible if the science and technology related to natural hazards are properly applied. While natural and other man-made disasters cannot be prevented from occurring, scientific knowledge and technical know-how, including other indigenous means that local people has already at its disposal, can be applied to increase the resistance of structures such as buildings and bridges and issue early warnings directly, organising proper community-based responses.

The situation in Liberia and West Africa in general, with the same geographical, climatic and political structures, requires similar solutions, except for minor differences. Having highlighted the major problem areas, i.e. the violent and continuous destruction of lives and property through “armed conflicts”, the major response is taken as a recommendation centred on alternative solutions to the dilemma and other less frequent disasters.

Nyewan identified in 2003 already some possible steps, actions and responses in view of overcome the social situation which is cause and consequence in a conflict situation in Liberia:

- "- investment to alleviate poverty, ignorance and disease;
- the enactment of laws to eliminate corruption, greed and intolerance;
- respect for human rights, justice and peace;
- curtailing abuse of public offices and disregard for law and order;
- putting an end to hypocrisy, sycophancy, ethnicity, bad governance and nepotism;
- equal distribution of the country's wealth;
- inclusion of all sectors of society in decision-making processes;
- encouraging peaceful co-existence and good neighbourliness;
- promoting genuine reconciliation, healing and national unification;
- preventing power and leadership struggles;
- singleness of purpose and a shared purpose as a major ingredient in nation building;
- negotiation and genuine compromises taking precedence over force and violence;
- putting culture and preservation of cultural heritage issues in the global governmental priorities and strategies."

A process is needed for the adequate gazetting and protection of all natural and/or cultural sites, particularly in north-east Liberia, to create more recreational facilities with appropriate safety measures, to control the population and rural-urban migration coupled and the consequent effects on heritage, and to create a positive environment encouraging tourism and increasing the accompanying benefits.

IV.6. MADAGASCAR-COMMUNITY RESPONSIBILITY AND INVOLVEMENT IN DISASTER RISK MANAGEMENT

Madagascar, as is the case of many other countries in the world, has experienced emergency situations of various kinds, such as floods and fire, plus attitudes which further contribute to the problem, for example indifference and ignorance. Museums and scholars, indeed everyone has a duty to find ways to preserve cultural heritage (both tangible and intangible) so that people can experience progress in harmony. Local community involvement in emergency preparedness and response may be "easy" as long as their traditions are respected, but it demands education and awareness raising. Many examples show that local traditions and community involvement can help solve difficulties and problems in Malagasy society, where written or State laws have yet to take root. It is true that traditional knowledge in disater risk management should be considered also in the society that quickly run towards modernity, often forgetting the important role that traditions could play .

Historical data shows that the Malagasy people are attached to cultural heritage objects — *objets témoins* — from their past. Cultural heritage is an inheritance passed on by the ancestors and every person must respect and take care of it. It includes old sites, tombs, sacred sites, royal relics, monuments and even simple objects. Today, many non-written rules are still scrupulously observed. For example, proverbs used to illustrate points in “Kabary” (literally meaning speech, discourse or a type of stylised oratory) often include warnings and urge people to comply with ancestral mores and customs.

Successive reigning dynasties used these traditions in part to legitimise their power while also endowing this heritage with a sacred character. Kings, queens, princes and princesses used and abused this tool to control their dependents. They even succeeded in spreading the belief that they were the only "sacred" beings. In the end, with clever and continuous manipulation of this ideology, the royal persons themselves became sacred.

The notion is deeply anchored in Malagasy culture. A first and defining characteristic of heritage preservation has been to keep it apart from any “contamination”, pollution or impurity. Any transgression of ancestral rules and laws relating to heritage, whether intentional or not, is a serious offence. The guilty parties are condemned to atone for or purify

their offence through a set of rituals. The sanction is primarily moral but also has material and financial overtones as the rites often involve sacrifice or gifts.

Today, the so-called modern era has eroded this devotion, especially in urban areas. Various internal and external influences require new behaviour patterns from the Malagasy. Antananarivo, the capital, has probably seen the highest number of cases of "accepted" transgressions, but the loss of traditions has given rise to a great deal of nostalgia. The first contacts with Europeans generated much confusion. The architecture of houses and tombs changed; people dared to build houses in stone, materials formerly reserved for the abode of the dead.

One of the first acts of the colonial administration was to move the royal tombs, without necessarily respecting ancestral customs. Urban development and demographic growth also made it impossible to respect the sacred features of spatial arrangement based on cardinal points. The gates to the royal city, made with gigantic stone disks which encoded the social hierarchy of the era, soon disappeared. Today only one remains; the sacred stones are only a memory. Today too, the few sacred springs still in use are drying up and are victims of ever increasing pollution.

Only one monument, the "Rova" (Queen's Palace) remained as testimony to this collective heritage (Fig.45.) But it too was lost, consumed in a fire in 1995. The disaster has been experienced not in terms of losing a museum collection, but as a profound moral shock with consequences which have not yet been fully measured. The real horror was the burning of the royal remains. The fact that the bodies were indecently exposed to the populace was the most reprehensible act for the people. This "pollution" shocked all Malagasy to the core.

Fig.45. What remains of the "Rova" after the fire of 1995. (© C. Menegazzi)

IV.6.A. Fire of the "Rova", the Queen's Palace, in Antananarivo

On the night of November 6th 1995, a fire destroyed all the monuments of the Queen's Palace, a site that dominated Antananarivo, the capital of Madagascar. The royal tombs, the individual royal sites (Tranovola, Manjakamiadana, Mahitsielafanjaka, Manampisoa and Besakana), and the temple were reduced to ashes. Some of the collections of artefacts (less than 20%) were saved from the flames (Fig.46.).

Fig.46. Collection inventory cards rescued from the fire . (© C. Menegazzi)

Consternation, sadness and anger were the feelings shared by all Malagasy who felt helpless in the face of such a disaster. The politicians made a unanimous statement on the urgent need to restore the Rova, the Malagasy term for palace. Hypotheses abounded: lack of precautions, an accident or criminal act. The official investigation concluded very quickly, too quickly in the eyes of some, that it was an accident.

UNESCO recommended that an independent Committee of local experts be set up to tackle the issue. This produced the National Committee of the Rova Operation. At the same time, the Ministry of Culture was overseeing the operations to set up an advisory committee to help this Committee.

Over the first months, emergency aid poured in from different sources. The money was used to clean up the site, have archaeological remains removed by archaeologists from the university, remedy dangerous situations, and draw up documents for reconstruction work. The first estimate for costs amounted to tens of millions of US dollars. The time frame for the project was estimated at five years and the works haven't been finished yet.

In addition to financial and technical problems, the reconstruction of the Rova gave rise to a range of social reactions. On the night of the fire, a bizarre event took place. The body of one of the queens, normally being in The Rova building, was found in the public square in the centre of the city. The following day these royal remains were the subject of a funeral vigil attended by many thousands. Officials came to pay tribute, bowing down in front of the body which was never identified.

The streets of the capital were full of small groups crying in grief and threatening possible culprits. People accused, in turn, government officials, social groups from outside the capital, foreign powers and so on. An explanation was needed and immediately. A series of dignitaries and politicians appeared on radio and television to support their different hypotheses. The fire was presented as a punishment or warning from ancestors. The Malagasy people felt a shared sense of guilt for past conduct in relation to ancestral values.

After a few days this popular movement of panic died down. The purported royal remains were put back in what remained of the royal tombs of the Rova. It was time to tackle the problem of reconstruction.

Given the size of the problem and the resources needed, priorities had to be set. The temple, which was the least affected part of the site, had to be the first element restored. Work concentrated on shoring up the stone walls of the main palace that threatened to collapse. The archaeologists continued their work drawing up an inventory and excavating the ruins. This was all that could be done in the course of the first months. It is importnant to note here the role of the archaeologists who are active also in a case of response like this one.

The general population focused on two aspects: the restoration of the roof of the main palace, and the royal tombs. People felt uneasy at the sight of the decapitated palace. If the roof was in place, at least there could be the illusion that the palace was still standing. In fact it was just as urgent to bring back the visual and sacred symbol of royal power which was still intact in the hearts of the Malagasy, despite the vicissitudes of the country's political past.

The rehabilitation of the sacred site was a major concern. With the fire, the site had been "sullied" and it was of the utmost necessity to have it purified. Ceremonies centred on the royal tombs were therefore organised to ask for forgiveness for any social wrongs committed, to re-establish the sacred character of the site and to ensure that restoration work was carried out without incident.

The issue of considering the fire as a "sully" make me thinking on the fire that blew up at the Royal Palaces of Abomey in Benin on 21 January 2009 which destroyed several buildings. The local authorities, and especially the community, organised sacred rituals immediately after the fire in order to « wash up » the sully brought by the fire.

In Antananarivo, this type of ceremony was repeated later for various reasons. The clans of the keepers of tradition each had their own interpretation of the facts. The discussions did not focus so much on the physical rehabilitation of the monuments as on the way it would be undertaken. The episode of the "central pillar", for example, took a passionate turn. The Committee declared it was technically impossible to replace the wooden pillar in the middle of the stone ruins of the main palace. The wooden pillar, which was more than 40 meters high, was the beginning of a major controversy. Some dignitaries insisted that the pillar should be put back in place using whatever means were required, and these arguments undermined the authority and expertise of the Committee. The pillar in fact had dual

symbolism. Men had carried it on their backs from the eastern region of Madagascar and popular opinion believed it should be made again, carved from a single piece of wood. The position of the huge tree trunk symbolised the power of the central kingdom in relation to the main pillars in the four corners of the building. It was very important that the symbol should not disappear. There was even one suggestion that a virtual pillar could be set up. The famous pillar, said to be carved from one log, was actually a series of cylindrical blocks.

Technical solutions for the task clashed at every turn with the demands and traditions of various groups who rarely agreed among themselves. Disagreements ranged from the choice of day to start work through to the type of wood to be used.

Tombs set as priorities were delayed as consensus could be reached on how to conduct the work. Everything to do with the royal remains was highly sensitive. The direct or supposed descendants of these reigning families had their own opinions. They were potentially the legitimate heirs; the only problem was that there were so many of them and with so many diverging points of view. It was as if every royal faction wanted to use the work as a way of asserting their position within the hierarchy of royal families. This attitude meant that the rest of the population felt helpless and excluded. This reached fever pitch in the first few months, but as the years have gone by, people have learned that life goes on without the Rova.

The Committee quickly drew up the technical documents needed to request local, bilateral and multinational financing. Evidence had to be provided showing that the work was beyond local capacities. With the budget and schedule, reconstruction would take several decades. It was vital to find substantial international help. This proved to be very parsimonious, only helping with the most pressing needs.

During the funding phases the site was closed to the public for reasons of security and safety. This was the most difficult period for a lot of Malagasy who used to go to the palace not to visit the museum, but to “speak" with these, the most important of their ancestors, the Kings and Queens for whom they show great reverence, giving them the title “Masina” or “sacred”. The royal tombs were the loftiest places for prayer, so when the people were deprived of access to the site, they had to fall back on sites far from the city which were less efficacious in generating real protection from the trials and tribulations of daily life. It was reported (although there was no proof) that some churchgoers tried to bribe the guards to gain access to

the tombs so as to whisper their requests there. This phenomenon went almost unobserved by the persons in charge, but had in fact upset a large part of the population. Most people urged the authorities to rebuild the Rova not so much for the monuments as for the symbolism. It was particularly important to recover the sacred, consecrated character of the site and to do this as quickly as possible.

In the meantime, the Malagasy gaze at the palace, unfailingly every day, hoping that one day it will recover its past splendour. The site is again open to the public and can be visited the same way as other ruins around the world. The presentation of the monuments, showing their foundations alone, depends on the quality of the explanations given by the guide.

IV.6.B. Other Rural Archaeological Sites

The hills around Antananarivo, some of which are important archaeological sites, are the focus for very lucrative land speculation, but the sites remain sacred as they were inhabited by ancient Kings or Queens or their close relatives. Laws and regulations exist to protect this heritage but the means to enforce them are sorely missing.

In the countryside, in the rural context, the situation is different. The population still respects the ancestral legacy but hopes for quick profits are beginning to erode its hold, and local communities have very few means of true defence in the face of outside forces. Facts over the last fifty years show that the population can only delay an action. Financial and economic imperatives inevitably take the upper hand.

Archaeological sites are the most vulnerable. In the majority of cases, the current occupants of the land do not have any direct ties to the remains. For some years now, the local population has been educated about the sacred nature of these sites. For the *Babay-Lohavohitra* project the local professionals are trying to establish a tie between the population and some of the major sites in the region, requiring permanent dialogue over many years, and the results are promising.

Babay and *Lohavohitra* are located about forty kilometres north of Antananarivo. These are old archaeological hill sites (about 1,510m above sea level) surrounded by ditches, dating from the 15th or 16th century, and where people today still perform traditional rites for the (royal) ancestors. These sites were chosen for their importance to the local community, to

conduct a program to preserve cultural heritage. The area includes a natural forest where traditional healers continue to collect medicinal plants for curing many kinds of disease, especially important when people cannot afford to buy imported medicines. In this forest, sacred places and sacred springs are also worshipped and, at the tombs, local people from surrounding areas or far away come to perform traditional religious rites.

After almost ten years, the cultural heritage professionals have succeeded in making people aware of the importance of sites and of taking care of them, explaining that they might also be a source of profit, both moral and material. During scientific reconnaissance and investigation, archaeological excavations, botanical collection and other missions, the local population has been involved and, alongside scholars, have discovered traces from the past and realised how rich their environment is. This approach is also a way of “recycling science” for a large audience, and as a result the communities are proud of their cultural heritage. The local population is now ready to work closely with us to re-introduce and recover traditional knowledge, products, techniques, games, handicrafts, etc. which they know are their cultural "property", their cultural heritage. The local community is very keen to retain this experience and is conscious that it is not undesirable to follow tradition. The experience is still in progress and cultural heritage professionals are continuing their dialogue with local communities, convinced that this approach may help to change their attitude and ease them into the future without culture shock. The next step could be to make people accept that they can have many things at the same time. A common saying is: "You may have either *Babay* or *Lohavohitra*, but you can’t have both at the same time!!". The Malagasy colleagues hope to replace this with the idea that different ways of life can be combined and that they are not incompatible.

In general, sacred sites are still relatively well protected. A permit from the village elders or notables is needed to gain access, but thieves can always manage to steal relics or funeral ornaments, selling them for absurd amounts compared to the value of the objects on the international market (e.g. the funeral statues from the *Sakalava* region, in western Madagascar). In these cases of theft or destruction, the vigilance of the local community cannot be questioned. It remains efficient internally but there is no hope in the face of outside forces taking advantage of the people’s extreme poverty.

Madagascar may become an interesting country case study to evaluate the role and the strength of local communities in preserving their heritage. For this, the experience of "Babay-Lohavohitra" needs to be extended to other places or an appropriate action framework should be developed for each community. General awareness raising at a national level is certainly needed but alone will be far from sufficient. Many attempts have been undertaken and continue. In addition to the National Committee of ICOM, the Ministry of Culture, other associations and NGOs for the preservation of cultural heritage have been working in their individual capacities.

Many examples could be cited showing that local traditions can help solve difficulties and problems in societies where written laws have yet to take root. We mentioned *Kabary* (speech or discourse), a form of oratory found in all Malagasy societies and which is used for ceremonies or when people from the villages gather to study problems and find solutions. There is also the *Fokonolona*, an assembly of people from the village. At *Fokonolona* meetings, held using *Kabary*, the concerns of community members are presented and are also seen in relation to specific tasks. The solidarity of the population, as expressed at the time of the Queen’s Palace fire, may be used to reach goals agreed on or set by the community. Local traditions can help revive traditional knowledge so that communities are proud of their cultural heritage and will use this knowledge in undertaking prevention measures against future disasters.

Local communities must be made aware of the fact that heritage and its preservation and conservation go hand in hand with development. Museums and other organisations have an important role to play in the field of preserving cultural heritage, and have the duty to educate, train and involve communities in different ways, one aspect being training in the field of emergency situations, a program which will have the communities fully involved when they know that this is their “property”.

IV.7. PERU- THE 2001 EARTHQUAKE IN AREQUIPA

An earthquake is a huge disaster: sudden, calamitous and highly destructive. It kills people and devastates buildings; it leaves survivors initially in a state of shock and depression and this means their response to the disaster is slow and sometime disorganised.

In June, 2001, Arequipa was struck by an earthquake that lasted almost two minutes, killing around one hundred people, destroying many buildings, blocking highways and ruining crops in the fields as a result of a tsunami that hit the coast.

A few months before the earthquake, UNESCO had proclaimed the historic centre of Arequipa as part of the World Heritage list, and this historic centre was one of the worst hit areas. 80% of the historic buildings (most from the 18th Century) were hit by the earthquake; for example, one of the steeples of the cathedral collapsed, making a hole in the vaulted ceiling and falling inside. The walls of the Church of the Third Order moved and the arched roof was pushed out of shape. The Franciscan Recoleta convent-museum had several walls collapse and cracks in the gallery and library, and many old books were buried in the rubble. In Santa Rosa monastery, the cloisters and stairway leading to the second level had serious cracks. The monastery of Santa Teresa saw the chapel, cloister and other areas unsafe for use, and part of the outer wall collapsed. In the technical reserves of the archaeological museum at San Agustín University, several storage shelves collapsed, breaking pre-Hispanic ceramics. Part of an external wall of Santa Catalina Monastery fell onto the street, and several walls in rooms inside cracked and shifted. In the church of Santa Marta, the steeple broke away from the nave, and in the church of Santo Domingo the steeple split in two but did not fall down. Many historic buildings used for housing could no longer be occupied as vaulted ceilings and walls had collapsed.

For cultural heritage, the first response to the devastation of the earthquake came from the Peruvian Army. One day later, in coordinated action with officials in charge, soldiers were trained within minutes to manually pick up and carefully classify fragments of carved stone from the façades and cornices. This left streets free for vehicular traffic and preserved architectural pieces which were later put back in place.

A problem requiring a more careful solution came with the pieces housed inside the historic buildings damaged by the earthquake. Paintings, sculptures, books, furniture and other cultural objects were under serious threat while still inside rooms which had collapsed or were about to collapse. Packing and inventory materials were needed, as well as specialised hands to carry out the task efficiently.

The rescue team was composed by six preservers (two volunteer restorers from Chile and four local preservers) and with the help of the Fire Department and owners or custodians of the endangered objects, they worked non-stop for eleven days and were able to rescue (register, surface-clean, pack and store) approximately 2,250 pieces, including paintings, sculptures, books, furniture and pre-Colombian ceramics from Santa Teresa and Santa Rosa monasteries, the Cathedral, the Church of the Third Order and the Recoleta and University museums.

IV.7.A. Lessons Learned from the Earthquake in Arequipa

It is very difficult to take proper action after a disaster. Even when prepared, cool and calm. The first feelings after a disaster are loneliness and helplessness: there is a lot to do; it is difficult to establish priorities; there are not enough hands, there is not enough money.

A decisive element in the successful rescue work after the Arequipa earthquake was the fact that they received international assistance without bureaucratic formalities. The only thing they had to worry about in Arequipa was planning the work and providing the Chilean volunteers with food and lodgings.

Another important aspect was to expand the working team including people from institutions which usually do not work with cultural heritage. The soldiers worked efficiently in saving architectural which otherwise would have disappeared in the path of earth-moving machinery. The Fire Department had a very special role: without neglecting its functions of helping the civil community, it was prompt in sending fire-fighters and equipment to work in the Church of the Third Order where the arch threatened to collapse at any moment, and to rescue paintings hanging from cornices ten metres high.

The owners and custodians of the rescued goods, with members of the religious orders and workers were actively involved in saving their collections. One interesting case was the cloister of the nuns at Santa Teresa. Almost 70% of the monastery building dating from 1710

had been affected; a large number of diverse objects had to be taken out and protected. Today all their collections are stored in three rooms dedicated as technical reserves. As a result of this experience and with their artistic heritage, the community of Santa Teresa is now the best prepared in Arequipa in terms of risk assessment, evaluation and preservation of its heritage. Because they now know and value their heritage more than before, the nuns have decided to open part of the monastery as a museum of colonial art to share their collections with the external world, and with the income generated by the museum, they will be able to preserve their cultural property more effectively.

The involvement of the community (army, firemen and religious orders) in the rescue work had a dual effect: it led to some eighty people being trained in basic techniques for handling and storing cultural objects, and it helped people realise that cultural objects have a special value, are very fragile and are property of the whole community; therefore, their protection is a task of us all, specialists and non-specialists alike.

Nowadays none of the rescued objects has been damaged again. The makeshift technical reserves where the objects were stored have been regularly monitored to detect any damage or harmful agents developing over time, and fortunately the objects have not deteriorated. The churches, monasteries and museums where the work was carried out are still restored and stable today; and the paintings, sculptures, furniture, books and other objects have been returned to their original places, except for the monastery of Santa Teresa where the collection is still in the technical reserves until the restoration of the church has been completed and funding found for the museum.

After the earthquake, the Municipal Superintendence of the Historic Centre of Arequipa prepared an action plan for emergencies designed to preserve buildings, and including one chapter on the preservation of cultural property. The document sees the training of municipal employees (municipal policemen, inspectors, gardeners etc.) in relation to knowledge of national and local laws for the protection of cultural heritage and basic actions to assess damage. The plan also has provision for lectures in schools and centres of higher education to provide information on the protection of cultural heritage. There is a recommendation that cultural heritage be included in earthquake drills conducted on a regular basis with the people of Arequipa.

IV.8. RUSSIAN FEDERATION- THE WORLD HERITAGE SITE “KIZHI POGOST”

The World Heritage site “Kizhi Pogost” is an enclosed architectural ensemble composed of two churches – the Church of the Transfiguration (1714), the Church of the Intercession (1694-1765), and the bell-tower (1862). A real masterpiece of log engineering that attracts many visitors. In 2008 200 000 people altogether visited the site.

The museum activities focus on securing longevity of the wooden monuments. The emphasis is on safety and fire protection, as well as on control of deterioration. The system of monitoring timber structures aimed to prevent biodeterioration is operated in the museum under the supervision of the chief curator. The monuments of the Kizhi Ensemble and the Pogost territory are equipped with security and fire-alarm systems and outdoor fire-fighting system with nozzles remote-controlled by the central security post.

Present-day integrated security system is managed and maintained by the “Kizhi” museum staff; by the Republic of Karelia, Division of the General Board of the Russian Federation, Ministry for Civil Defence, Emergency Management and Response to Natural Disasters; and by the Republic of Karelia, Division of the Ministry of Internal Affairs.

The World Heritage site Kizhi Pogost is a masterpiece of Russian wooden architecture. It is located on a small island of Kizhi in the north-west part of Lake Onega – the second largest lake in Europe (Fig.47.).

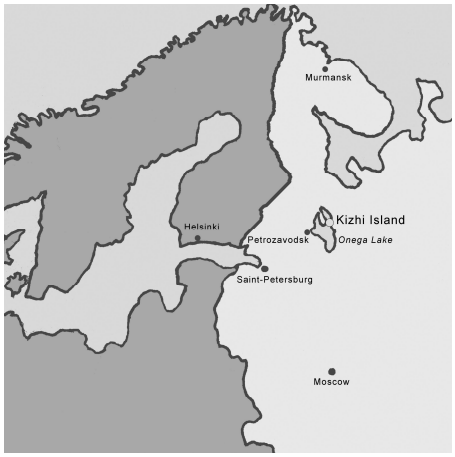


Fig.47. Location of Kizhi island. http://kizhi.karelia.ru/info/en//about/txt3 (20.02.09)

Since prehistoric times Kizhi Island was supposed to be a sacred place for Finno-Ugric pagan tribes. The name of the island can be translated from Karelian as “a place for ceremonies”. The first Russians came here from Novgorod the Great in the 12th century. Since the 13th century they began to settle on the shores of the lake side-by-side with the native people. The Russians brought new constructive technologies, more progressive soil cultivation, crafts and a new, Orthodox, religion. They began to build the first orthodox churches on the sites of pagan sanctuaries. The Orthodox churches in Kizhi were first mentioned in Moscow census books in 1563. However, according to the historic documents those structures were struck by lightning and burnt down in the end of the 17th century. Then the new churches were built at the same place. The Kizhi Pogost architectural ensemble as it looks today, had been formed over a period of two centuries (from the end of the 17th – to the mid-19th centuries). It is an example of traditional Northern Russian ternary group of buildings where a bell tower is located between the summer and winter churches (Figs.48. and 49.).

Fig.48. The Kizhi Pogost of our Savour. The Bell tower (1862), the Church of the Transfiguration (1714) and the Church of the Intercession (1764). (© O. Semenenko)

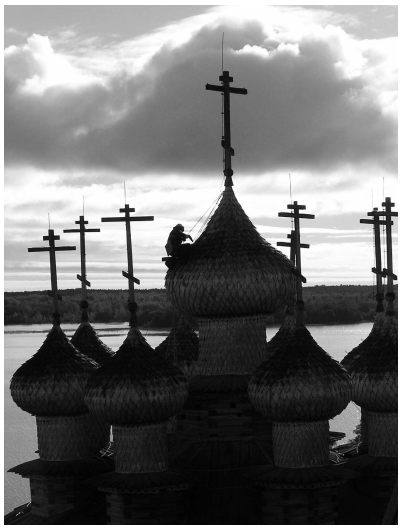


Fig.49. Checking of the lightning system on the Church of Intercession. (© A. Ljubimtsev)

The Church of the Transfiguration (the summer church) was built in 1714, the Church of the Intercession (the winter church) - in 1764, the Bell Tower - in 1862. The structures are surrounded by the log wall. The Kizhi architectural ensemble, property of the Russian Federation, has been in day-to-day management of the “Kizhi” State Open-Air Museum since 1966. In 1990 it was included into the List of the World Heritage of UNESCO. In 1993 Kizhi churches were listed as the most valuable objects of the Cultural Heritage of the Russian Federation. The Kizhi churches are the most attractive sights in the Republic of Karelia. The churches are the highest points in the area. The Church of the Transfiguration has been serving as a visible symbol, from the distance, of Orthodoxy for nearly three centuries. Its height is 37 m (123 feet).

The main attention in disaster risk management on Kizhi is paid to fire protection. Lightnings are very often in the region and they can cause serious problems for wooden monuments. As it was mentioned above the previous wooden structures in Kizhi were struck by lightning and burnt down in the end of the 17th century. That’s why protection against lightning is of great importance. The new lightning system was installed at the monuments in 2004. Every year it is checked by the museum employees.

The monuments of the Kizhi Ensemble are equipped with fire-alarm systems and outdoor fire-fighting system (Fig.50.). The fire –alarm system is supplied with the flame fire-sensors which are placed in the interior of the Church of the Transfiguration and along the perimeter of the enclosure. The smoke detectors are located in the interior of the Bell tower and the Church of the Intercession. Seven remote-controlled nozzles of the fire-fighting system are installed along the perimeter of the Pogost enclosure.

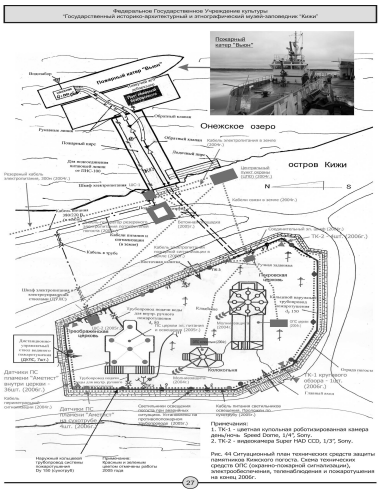


Fig.50. The plan of the security system of the Kizhi Pogost objects. (© N. Popov)

The manually-controlled fire-fighting system is placed in the Church of the Transfiguration. The fire-fighting systems are regularly checked and repaired if necessary. The fire team watches the Kizhi Ensemble around-the-clock (Figs.51. and52.)

Fig.51. Fire pipeline. Fire monitor. (© A. Ljubimtsev)

Fig.52. Fire boat "Vjun". Central guarding post. (© A. Ljubimtsev)

The Kizhi museum is located at 68 km from Petrozavodsk – the capital of Republic of Karelia. The nearest village with the police station is at 26 km from the island, that's why the securing of the monuments and collections is of great importance. All the monuments are equipped with the security system. TV monitoring system covers the visitors' entrance area. Installation of powerful lamps around the Kizhi Ensemble also serves to the purpose of controlling the area especially in winter when the days are short.

During its 300 years long history the Church of the Transfiguration has been periodically repaired and maintained. In 1980's the condition of the structure was recognised as crucial and a steel framework was installed inside the building to support and reinforce the structure. At that time the iconostasis and the "sky" ceiling were removed from the interior of the

Church and placed in the storage. Nowadays a restoration project has started aimed at regaining structural strength, dismantling the steel supporting structure and re-establishing the iconostasis and the “sky” ceiling in the interior. To control the safety of the structure during the period of its restoration additional video surveillance camera system has been installed in the Church of the Transfiguration (Fig.53.).

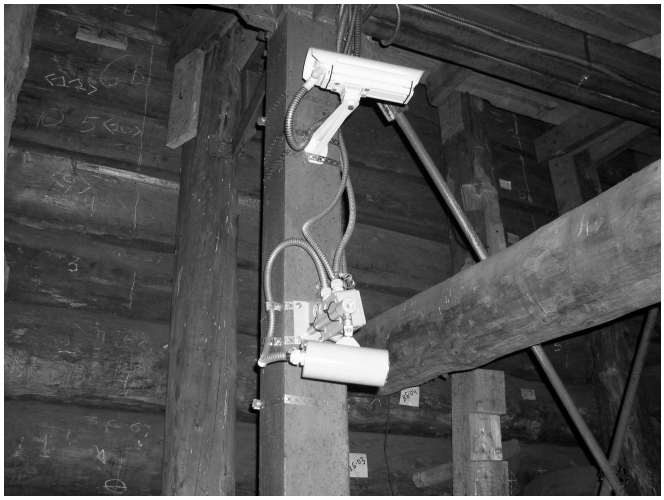


Fig.53. WEB-camera and fire alarm sensor in the Church of the Transfiguration. (© A. Ljubimtsev)

All the full-time museum workers as well as seasonal custodians and guides are trained how to respond to possible threats (a fire, vandals, theft, etc.). Nowadays the main problem concerning the protection of the World Heritage site from disasters is the impossibility to provide water supply in the fire protection system in winter time, when it is not feasible to get pumps of fire-boat “Vjun” that produce enough volume of water (at least 150 litres per second) for fire-fighting. This problem, will be solved in 2010, by designing and constructing a stationary pump installation for Pogost fire protection. It is also important for the restoration of the Church of the Transfiguration, because this is not possible in winter unless this problem is solved. Besides, winter is the most favourable moment for restoring church log framework because there are no tourists and there is no need to obey to limitations related to this issue. During 2009 it is also planned to mount two additional remote-controlled nozzles and implement a fire-fighting system of extinction fire with high fog stream in the Church of the Transfiguration as well as to install the fire mains with hand-controlled nozzles inside the Church of the Intercession and the Bell-Tower. Another important deal in providing safety of the monuments is a reliable electricity supply. Since 2005 it was used the diesel generator for

providing a reserve power supply system for the equipment of monuments' protection in case of the electricity network blackout.

The Government of Russian Federation is aware of the importance of preserving Kizhi Pogost and this is why it approved by Decree № 1633-p (as of 07.11.2008) "the schedule of measures on preserving Kizhi Ensemble and developing infrastructure of the Kizhi Museum". First of all it is aimed at preservation of the monuments in Kizhi. Preservation means not only restoration and conservation but it is aimed at provision for integral protection, especially for the Kizhi Pogost monuments.

In December 2008 the Ministry of Culture of Russian Federation issued the order (N 282) concerning the preservation of the Kizhi Pogost architectural Ensemble and development of infrastructure of the Kizhi Museum. One of the main issues highlighted in the plan is a provision of reliable power supply on Kizhi island. At the present moment Russian Government takes the unprecedented measures to stimulate the museum's growth. It will raise the standards of the Russian professional work to a higher level and thus secure the preservation of objects of cultural heritage.

IV.9. SOUTH KOREA-THE FIRE ON THE SOUTH GATE OF SEOUL

Sungnyemun, the South Gate of Seoul, has been the main gate of the city wall of Seoul during the Joseon Dynasty. The South Gate was built in 1398 and relocated to the present place in 1447. The South Gate is the oldest wooden structure in Seoul. Nowadays, location (Figs.54. and 55.) of the South Gate which was the southern area of old Seoul is becoming the centre of the Seoul Megalopolis. The base structure is made of granite blocks pierced by a single arch for gateway. The wooden superstructure is a two-storied pavilion, five compartments on the front and two compartments at the sides, with a hipped roof. It originally had a hip-and-gable roof but it was reworked into a hipped roof. It is a profusely-bracket-style building with intermediate sets. According to the record of "Jibong-yuseol", a book on the "practical science", Prince Yangnyeong handwrote in the plaque the name of the gate "Sungnyemun". This building is one of the rare wooden structures with its year of construction known.

Fig.54. Location of the South gate in the Seoul map.

Fig.55. Location of the South gate in the Seoul map.

IV.9.A. Risk Faced by the Site and History of Disasters

The stone wall of Seoul linked with the South Gate of Seoul was removed between 1907 and 1909 to accommodate increased traffic. The South Gate has been isolated by heavy traffic since the entire removal of the stone wall of Seoul.

It was thought that the South Gate was safe from arson and vandalism, because it was hard for potential criminals to access to the isolated South Gate by heavy traffic. Moreover, the location of the South Gate is very close to Jong-ro fire station which is within a mile from the South Gate. Due to the great advantages of security and accessibility of the fire station, it had only two portable fire extinguishers and few infrared detectors against intruders when the fire blew up.

IV.9.B. The fire on the South Gate by arson

The fire was broken out by the 70 years old man who had planned to set the South Gate on fire to express his complaints about inappropriate compensation of his land taking for city development. He infiltrated into the South Gate on February 20, 2008, the last day of the lunar new years' holiday. He went to the second floor and set fire on 20:50 with three bottles of "thinner" which were ignited by the incendiary near one of the south-western pillars. The infrared detectors alarmed five times from 20:47 to 20:50, and a taxi driver reported the fire to

fire station at 20:50. Jungbu fire station dispatched fire engines to the South Gate within 3 minutes and fire fighters break into the second floor of the South Gate to extinguish the fire. Inspite of such a quick response, the fire fighters did not know how they put out the fire because the fire on a large wooden heritage has a unique fire spread (Fig.56.).

Fig.56. The South Gate after the fire. (© Y.H.Jung)

IV.9.C. Efforts to extinguish the fire

The fire on the second floor was brought under control between 21:13 and 22:03 by the effort of fire fighters. However, the flame caused by fire plume spread to the upper structure of rafters, which had little space separated by wooden boards over rafters and was filled with logs and wood sticks to lessen roof weight. The fire fighters were not familiar with these kinds of wooden structure, and they didn't understand why smoke still went out from the upper structure. This phase was called smouldering combustion stage. Finally, the fire flame inside of the upper structure went out from the eaves of the second story at 22:02. Fifteen fire engines shoot out water (Fig.57.) to the eaves and inside of the second floor from 22:05 to prevent the spread of the fire to the first floor. Regardless of fire fighters' efforts, the water could not get into inside of the roof as it was covered by roof tiles and lime mortar layer beneath. Although it was too dangerous to access the steeply slanting and freezing roof, fire fighters tried to remove roof tiles to pour down water into there from 23:00. However, they realised that the removal of roof was impossible because of thick lime mortar layer which was too strong to be removed.

At 23:10, they cut out the plaque inscribed with the name of the South Gate, “Sungnyemun”; which was known as masterpiece of prince “An-pyung.” At the next day of the fire, the second floor had been collapsed at 01:56, and extinguishment was completed at 02:05.

Fig.57. Fire engines shooting out water on the South Gate. (© Y.H.Jung)

IV.9.D. Movable Heritage Rescue

It is intersting to note that the plaque (Fig.58.) with the inscription of the name of the Gate was the only movable element of the heritage site. The fire fighters were struggling in order to be able to remove this high symbolic element. The Korean colleagues told me that this action was considered extremely courageous and it permitted the local authorities not to lose their face in front of the population

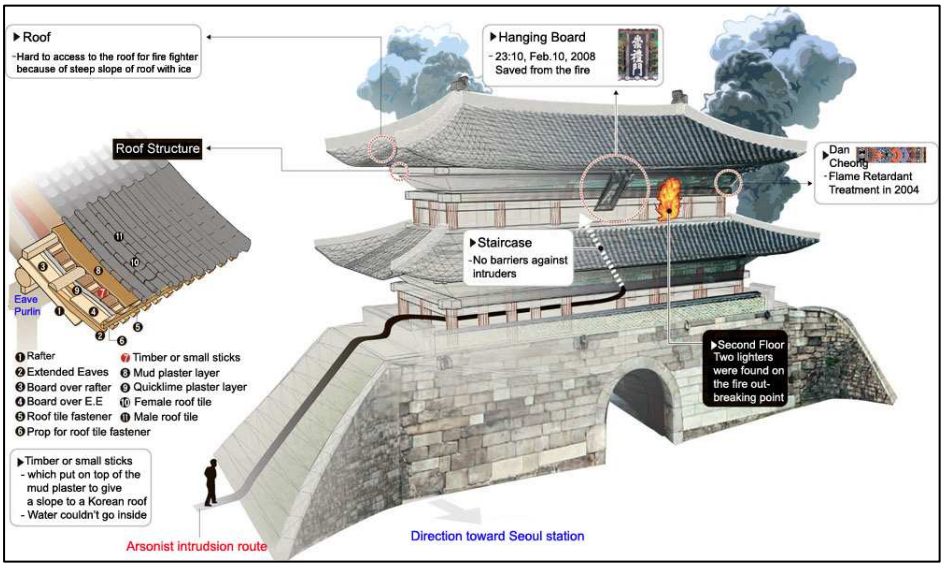


Fig.58. Hanging board positioning.

IV.9.E. Reported Damage and Measures Taken

As a result of the fire, the South Gate lost its 90% of the second floor and 10% of the first floor. The reason why the damage of the first floor was small under the influence of the large-scale fire was that the roof of the second floor was collapsed outside instead of inside of the first floor. Although the base granite structure didn't seem to be harmed by the fire, Cultural Heritage Administration, the central heritage management organization of the Republic of Korea, worried about the stability of the base structure because of the soaked water during extinguishment.

The Cultural Heritage Administration (CHA) decided to conduct survey to make a damage report which would be very helpful for the South Gate restoration work. The National Research Institute of Cultural Heritage took the role of risk assessing while the repair unit under Royal Palace and Tombs Division of the CHA reinforced the remaining elements of the South Gate as well as saving debris of roof tiles, rafters, brackets, pillars, etc. The CHA established the South Gate Restoration Task Force and announced the basic restoration plan for the South Gate on May, 2008.

The main steps in the basic restoration plan are as follows;

- Restoration of the South Gate as it was using historical evidences and precise survey done by 2005.
- Reuse of original materials as much as possible.
- Reconstruction of flank stone wall through excavation of the site.
- Restoration work by intangible cultural asset holders with traditional building technique and traditional tools.
- Organisation of advisory board consisting of Cultural Heritage Committee members, professionals, engineers, etc.
- The CHA's direct management for the restoration work including budget, technical support, etc.

Following the basic restoration plan, the CHA is planning to spend 22 million U.S. dollars to restore the South Gate by 2012. As the first step toward the restoration of the South Gate, the CHA constituted three advisory committees - Historical Investigation Advisory Committee, Technical Advisory Committee, and Risk Management Advisory Committee- to handle the South Gate restoration work. At the same time, the CHA started excavation

around the South Gate to find historical evidence for stone wall reconstruction and built a temporary building for protection of the South Gate during restoration work. Now, the restoration design work is actively underway based on a through survey of the gate in 2005.

IV.9.F. Issues on Emergency Equipment against Fire

There are many debates on the issue whether emergency equipment such as dry/wet sprinkler, water mist sprinkler, fixed fire extinguish ball system is adoptable to the traditional wooden structure like the South Gate of Seoul. Some Cultural Heritage Committee members argue that those systems may cause damage to wooden structures with their imperfect mechanical stability-freezing and bursting, water spray by malfunction, etc. as well as the aesthetic aspect. However, others believe that the wooden structure with the technically unstable emergency system would be better than the wooden structure with nothing. Concerning this issue, most of the Cultural Heritage Committee members keep a distance from an opinion to adopt emergency system in wooden historic structures. However, the CHA is trying to install emergency equipment in five royal palaces as risk prevention and as a consequence of this disaster. To narrow down the scope of the issue to the South Gate, its restoration work will include emergency equipment such as dry sprinkler, water cannon, unattended security system, and flame/smoke detectors without any conflicting views. The introduction of new materials like flame retardant components, silica sheet inside of the South Gate it is still disputable in terms of material authenticity and traditional building technique.

IV.9.G. Learning from the Fire and Systematic Changes

The fire on the South Gate has left important implications about security of cultural heritage.

Firstly, prevention of fire, especially in wooden structure, is a key issue because on wooden structure it is almost impossible to extinguish fire after its ignition.

Secondly, initial extinguishment by owners or building managers is very important because the fire damage in wooden structures can be minimised by proper initial extinguishment. To cope with this issue, the CHA distributed 150 customised risk management manuals for wooden cultural properties in 2008 and is making 389 manuals for historical sites and important folklore materials in 2010 as well as educating owners and managers.

Thirdly, systematic countermeasures against fire in various aspects are needed. To handle this issue, the CHA in cooperation with the National Emergency Management Agency has revised the Fire Protection Code, which had no installation enforcement for emergency equipment, to force owners and managers of National Treasures to install fire alarm systems and fire hydrants.

IV.10. VENEZUELA-DISATER RISK PREVENTION ACTIONS

Under its Institutional Relations Programme, the Venezuelan Committee of ICOM devised a project in mid-2001 called “Emergency Brigades for Cultural Heritage”. The general purpose of the project was to train qualified professionals for salvage and rescue activities permitting rapid interventions, retrieval and treatment of any cultural heritage items damaged by a variety of possible disasters (earthquakes, tsunami, flooding, volcanic eruptions, fire, terrorism or civil war). Carrying out preventive activity to counter such phenomena was one of the challenges of the project, seeking to develop skills for avoiding, delaying, preventing and/or detecting situations potentially threatening the country's cultural properties.

When the project originated, Venezuela was still haunted by memories of the massive landslides of December 1999 in Vargas state. The pictures of the disasters had been seen on television worldwide. It was said on that occasion:

> "But the magnitude of the tragedy far outstrips anything that television can depict. Thousands of lives lost. Incalculable material damage. Dislocation of communities (with all the social and cultural implications). Dramatic transformation of urban landscapes (in some cases up to unimaginable limits of total destruction). Awesome changes in topography. These are some of the major traits of the rundown of events."[3]

The torrential rainfall and subsequent flooding carried off the most emblematic museum in the area: Armando Reverón's *El Castillete*, the magic refuge of the Venezuelan painter of light. He built it as his dwelling place and workshop, furnished it and populated it with equipment and characters of his own artistic making and creative imagination. At the time of the tragedy, just few of his works were kept in the museum together with others prominent artists. In addition to *El Castillete*, the landslide carried off many liturgical objects, urban sculptures and thousands of personal objects representing the culture of *La Guaira*, an urban complex of historical importance; not to mention the lives, the traditions and the memories that were also lost.

The “Emergency Brigades for Cultural Heritage” project was intended to be for the benefit of professionals of various disciplines connected with museums or with management of the

[3] *Vargas: Patrimonio en emergencia*. Edited by María Ismenia Toledo, Instituto del Patrimonio Cultural, Caracas, 2000.

movable heritage, both in Venezuela and in the rest of the Andean countries like Bolivia, Colombia, Ecuador and Peru. The Training in movable heritage disaster risk management was accompanied by activities involving research, publication, promotion and diagnosis of regional resources.

A series of working meetings involving exchanges of ideas and experience between various organisations concerned with disaster risk prevention and the management of emergency situations within the country were organised. They were attended by government entities connected with the police, fire-fighting and civil defence services; the Venezuelan Seismological Research Foundation (FUNVISIS), the Sectoral General Directorate for Museums, the National Library Foundation, the Arturo Michelena Museum, and the National Parks Institute...

In connection with these meetings, I took part in the ICOM Study Mission in 2003 in Venezuela as part of the project "Museums Emergency Programme". The Mission wanted to gather information on the national situation and institutional motivation. Various centres with experience in managing risk situations in the country were visited. The Study Mission reached agreement on three proposals:

- to establish a national committee for the prevention of risks to Venezuelan cultural heritage.
- to set up of thematic subcommittees to deal with experience in human resources training, standards and legislation, and documentation of experience.
- to prepare a regional training in Venezuela for 2005, on the topic of risk prevention in museums in Latin America.

As a result of this mission, the basis of the establishement of a National Committee of the Blue Shield in Venezuela were set. The National Technical Committee for the Management and Prevention of Risks to Cultural Heritage, was formed as an initiative prior to the establishment of the Committee of Blue Shield.

Furthermore a particularly significant event was the framing of the National Risk Law for which the Venezuelan State has set up a national-level commission involving all the organisations concerned. Issues relating to cultural heritage were absent from the list of

topics. Following the meetings and the establishment of the Committee, an official appointment was requested for a representative from the Cultural Heritage Institute.

CHAPTER V

CONCLUSIONS

V.1. INTRODUCTION

I have had the chance and the honour to be, in the last twenty years, a participative witness in the process of modelling of the disaster risk management of cultural heritage by working and having a very close relationship with the main institutions and professionals who have contributed to its evolution. The participation in conferences and workshops in many countries; the possibility to discuss and question personally face to face with dedicated and experienced colleagues with a very high scientific motivation and skills; the opportunity to develop training curricula, tools and methods in disaster risk management; brought me to the idea to devote time to this research.

Personal and professional circumstances haven't been very favourable and propitious during the period of my research and I beg forgiveness for all my inaccuracies. This research has been for me, however and especially, the pillar and the reference of my scientific *raison d'être*. It has been with enjoyment and profound satisfaction that I dedicated my interests in the disaster risk management field.

I remain open to all questioning and hope to continue finding motivation and whetting my curiosity with further challenges in this research field.

V.2. DEFINITIONS AND TERMINOLOGY

Considering the objective of the research which was: to explore how from the origins of preventive conservation we are currently dealing with disaster risk management issues; I can say that often disaster risk management approaches, and even methodologies, remain buried under the weight of occidental, and even more Anglo-Saxon and French, cultural predominance. The terminology, for example, is "decided" by big international intergovernmental and non-governmental institutions. The main task of the "countries", and the cultural heritage professionals living there, remains the translation of such terms into their own language trying to apply "those terms" to concepts, methods, and approaches in disaster risk management that already exist, and existed in the past too, in the countries themselves.

As presented in Chapter II.1. and II.2. the definitions of preservation, restoration, conservation - being curative or preventive- went under a cascade of complications when people tried to define those terms strictly considering the conceptual meaning of the words. It was seen that -according to the Resolution adopted by the ICOM-CC membership at the 15th

Triennial Conference in New Delhi, India on 22-26 September 2008 about the terminology to characterise the conservation of tangible cultural heritage- the terms are more defined and distinguished according to the aims of the measures and actions they encompass.

The same has happened in trying to "universally" define the terms of the disaster risk management cycle such as: risk assessment; risk evaluation; preparedness; readiness; response and recovery as an example.

By approaching the disaster risk management issues in other fields, than the cultural heritage, the definitions are more digested and digestible and commonly used in different regions of the world. I have explored the terminology used in the humanitarian disaster relief field or in the military, in the infrastructural engineering and medical ones.

V.3. IMPORTANCE OF TRADITIONAL KNOWLEDGE

What is fundamental to retain is that a local and intercultural sensitiveness is necessary in order to avoid a too easy globalisation and application of "pre-cooked" terms, methods, and approaches everywhere and every time.

The identification and/or the rediscovering of traditional knowledge techniques and methods to cope with disaster risks are of foremost importance. And even more, it is fundamental that governments recognise this and that resources will be put ad disposal to undertake research on these subjects. In the delicate recovery phase of a disaster, when a reconstruction of a village is needed for example, it has been recognised of paramount significance to listen to the local populations and consult members of the communities that deal with the protection and use of the local cultural heritage before taking decisions on how to build the new village settlements.

This is especially true if we want to have an ecological and cost sustainable approach to disaster risk management.

V.4. LIMITS OF METHODS' APPLICABILITY

The methods that were presented in the research-although the list is not exhaustive of course-, and in spite of their originality, coherence, scientific advancements and credibility, they are sometimes unlikely applicable to a "normal situation" in a cultural heritage institution. My experience as museum curator working in contact with many colleagues of museums all over

the world that try to cope with daily difficulties -being lack of human specialised resources and/or financial ones; but also being connected with the political, managerial, social and economic instability of the local societies- teaches me that too sophisticated disaster risk assessment methods, for examples, are far to be useful when a very pragmatic approach is requested in assessing the entity of the risks after a disaster.

V.5. LESSONS LEARNT FROM CASE STUDIES

Several case studies from different parts of the world are presented in this research. Their choice has been assumed considering also the medium term and long term recovery period after the disaster has occurred. It is of course meaningful to study how a community respond to a disaster and how it copes with the, sometimes, little resources at disposal. But it is even more significant to observe how the same community survived to the catastrophe. Which were the grips that moved this community to continue living in the same place, knowing and having increased its perception of the risk because having experienced the disaster?

This is why therefore some case studies present recurrent catastrophes, some others past or very recent ones.

The use of case studies is justified as a support to better understand the diversity of situations that are developed in the case of a disaster.

V.6. A NEW ROLE FOR THE ARCHAEOLOGIST

From the research, it emerges that the professional profile and the tasks of the archaeologist could be better and more rationally used in the disaster response actions, being these linked to wars, to earthquakes, to building collapsing, to fire and possibly to floods and landslides too.

I have personally experienced that the excavating techniques and methods that are used, sometimes without any logic organisation, do not differ from those of the archaeologists.

V.7. FURTHER DEVELOPMENTS

I consider this research as an “appetizer” for further studies. I have identified some ideas about which I would like to dedicate my time during the next years:

- Further develop traditional knowledge in disaster risk management;

- Validate the inclusion of illicit excavations and illicit traffic of cultural properties as a risk;
- Extend the research to the response and recovery methods;
- Continue to collect and analyse case studies from all over the world;
- Introduce an ecological and cost sustainable approach to disaster risk management linking it with climate change as well.
- And finally enjoying speaking about disasters with my children.

CHAPTER VI

ANNEXES

I Bibliographies
- I.a. Annotated Bibliography
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- I.c. Bibliography on line

II Forms, etc.
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- II.b.GCI Conservation Assessment
- II.c. ICCROM Preventive Conservation Indicators
- II.d. Museum Needs Assessment
- II.e. Questionnaire MEP-Teamwork for Integrated Emergency Management
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- II.h. ICCROM Manual of Collection Risk Management (Archive)
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III International Declarations/Chartes/Recommendations on Disaster Risk Management
- III.a. Hyderabad Recommendations
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IV List of Web Links

V List of Training

VI List of Conferences

VII International Organisations and Research Institutions

VIII Webgraphy

...

I BIBLIOGRAPHIES

I.a. ANNOTATED BIBLIOGRAPHY

A. Risk Management outside the heritage field

B. Risk management within the heritage field - general

C. Risk management within the heritage field - specific to emergency preparedness

D. Risk Information by agent of deterioration

1. Physical forces general
1. Physical forces - Collections in transit
2. Thieves and vandals
3. Fire
4. Water
5. Pests.
6. Contaminants and pollutants
7. UV and light
8. Incorrect relative humidity and incorrect temperature

ANNOTED BIBLIOGRAPHY

A. Risk Management outside the heritage field

Books and articles

AS/NZS 4360:2004 : Australian/new Zealand Standard for Risk Management

2004, 28 pages, ISBN: 0-7337-5904-1

Provides a generic guide for managing risk. It may be applied to a wide range of activities or operations of any public, private or community enterprise, or group.

Against the Gods: The Remarkable Story of Risk

Bernstein, Peter L., John Wiley & Sons, 1998, 400 p. ISBN: 0471295639

A very well written and entertaining book about the history of risk. Its focus is on financial and particularly investment risk but is of general interest. It discusses the development of the concepts and mathematics behind risk analysis beginning with the earliest games of chance and proceeding through to complex computer-based investment strategies.

Cartographies of Danger: Mapping Hazards in America

Monmonier, Mark, The University of Chicago Press, Chicago and London, 1995, xiv+363pp.

Introduction to Decision Analysis, A Practitioner's Guide to Improving Decision Quality

David C. Skinner, Probabilistic Publishing, USA, 2001, 370p.

Introduction to Decision Analysis is a practical, step-by-step guide to making better decisions. The book is designed for the practicing manager, technical professional, and decision analyst. The book provides proven techniques based on solid experience to help face complex, challenging, uncertain, and ambiguous choices. Decision analysis provides a process whereby all parties affected by the decision can be involved and participate in building a win-win solution. New to the second edition are: new thinking about uncertainty and ambiguity, Monte Carlo simulation, guides to implementing large projects, "How 2" guides, and full interactive integration.

How do societies manage risks? Mileti D.S. and Peek-Gottschlich L.A., In: *Rational Decision-making in the Preservation of Cultural Property* edited by Baer N.S. and F. Snickars, Berlin: Dahlem University Press, 2001, p. 35-45. ISBN 3-934504-07-8
Two fundamental approaches of societies in dealing with and managing the risk of losses from the occurrencen of natural disasters are reviewed in order to raise questions and draw parallels for the preservation of cultural property from the yield of natural hazards. The two risk management approaches in the natural hazards field that are identified include dichotomizing risk and redistributing risk, costs, and losses onto others. These fundamental approaches are summarized and then related to how they result from the tendency of societies to adhere to the approach that most closely fits with he basic value system of that society, rather than the approach that might work best.

Probabilistic Risk Assessment and Management for Engineers and Scientists Kumamoto, Hiromitsu, Henley, Ernest J., Institute of Electrical and Electronics Engineers, Inc. New York, USA, 1996

Risk Analysis and Society, An Interdisciplinary Characterization of the Field, McDaniels, Timothy and J. Small, Mitchell (eds.), Cambridge University Press, 2004
This book provides an interdisciplinary and international characterization of the state of the art and science of risk analysis. Such an analysis is needed to ensure better management of choices concerning environmental, health and technology-based hazards that increasingly affect peoples' lives on an international scale. Including chapters by many of the world's leading risk researchers, this comprehensive work will provide insight into the scope of important social and technical issues that influence risks and their management.

The Logic of Failure, Dorner, D., Perseus Press; 1996, 222 p. ISBN: 0201479486
This book describes the ways in which humans have difficulty in managing complex systems over time. In particular, the problems of maintaining a sense of priority in managing systems that provide little or no meaningful and timely feedback about the effect of implemented strategies. This speaks directly to the difficulties in preventive conservation planning where the consequences of measures taken will usually not be known for decades, if ever.

The Psychology of Judgment and Decision Making, Plous, S.. McGraw-Hill Higher Education, 1993, 352 p. ISBN: 0070504776

This book provides a very engaging and enlightening review of the ways we, as humans, make judgments under uncertainty. Heuristics (rules of thumb for thinking) and their resulting biases are explained. An interesting feature of this book is that representative questions, from many of the psychological studies referred to in the book, have been grouped together into a questionnaire at the beginning of the book. By completing this before reading the book, we can see to which fallacies we are subject before we are influenced by recently reading about a particular heuristic or bias. The book helps establish a sound perspective for considering the quality of our judgments in
complex situations.

The rational manager; a systematic approach to problem solving and decision making, Kepner, C.H and Tregoe, B.B. Kepner-Tregoe, Princeton NJ. 1976

A classic and readable book on basic decision-making using lists of pros and cons, etc.

The wisdom of crowds, Surowiecki, James. Doubleday, New York. 2004.

A readable and entertaining book on how to get the best "collective wisdom" out of groups of people. Useful ideas for how to collect risk assessment expertise from museum staff. Explains when (and why) it is best to let individuals contribute prior to any group dynamics, and when (and how) to use groups in committees. Contains many of the elements that are more technically described in the literature on "eliciting expert opinion."

Uncertainty, A guide to Dealing with Uncertainty in Quantitative Risk and Policy Analysis, Morgan, M. Granger and Henrion, Max, with a chapter by Small, Mitchell, Cambridge University Press, 1990

B. Risk management within the heritage field - general

Books and articles

An integrated approach to risk assessments and condition surveys, Taylor, Joel , In: *Journal of the American Institute for Conservation*, Vol. 44, N. 2, 2005, p. 127-141, ill., ISSN 0197-1360

Discusses the integration of risk assessment and collection condition surveys, with reference to the uncertainties inherent in each of these two procedures. While condition surveys provide information on a collection's immediate condition, risk assessments add predictive aspects on the collection's potential for deterioration. Looking at probable causes of damage in a condition assessment can provide a link to the agents of deterioration examined in a risk assessment. Combining these two complementary assessments can provide useful insights and clarify priorities for the collection's management goals. Comparison of the advantages and disadvantages of two types of evaluation processes in visual perception, top-down and bottom-up, are discussed as they apply to the integration of the two assessments. Additionally, the article describes the use of an integrated assessment approach for a survey of the English Heritage collections. In conclusion, it was found that integrating condition surveys with risk assessments could increase the knowledge and understanding of current and future expectations of a collection.

Archival management: preliminary risk assessment, Halfen, Lawrence N., In: *The abbey newsletter*, Vol. 27, N. 2, 2004, p. 13-15, ISSN 0276-8291

Assessing the Values of Cultural Heritage: Research Report, de la Torre, Marta (ed.); Los Angeles: The Getty Conservation Institute, 2002, 123 p.

This report covers the assessment of values and consultations with the stakeholders, and it explores methods already used in ethnography, geography, economics, and environmental conservation.

http://www.getty.edu/conservation/publications/pdf_publications/assessing.pdf

Assessment and management of risks to cultural property, Baer, N.S.; Baer, N.S. (ed.); Sabbioni, C. (ed.); Sors, André I. (ed.) , In: *Science, technology, and European cultural heritage: proceedings of the European symposium, Bologna, Italy, 13-16 June 1989*,

Guildford, Surrey: Butterworth- Heinemann Publishers, 1991, p. 27-36, figs. ISBN 0-7506-0237-6

Formal computations of risk are now a common-place in the nuclear power and chemical industries. Similarly, those responsible for the preservation of cultural property in museums, libraries and archives are beginning to consider more objective decision-making procedures for selecting conservation options. The process whereby sources of risk are identified and quantified forms the discipline of risk assessment while the selection among alternative policies developed in response to that risk is known as risk management. Sources of risk to cultural property are identified and characterized. Examples of risk management for cultural property based on laboratory data, e.g. he setting of light levels for exhibitions are presented.

Care and preservation of collections, Michalski, Stefan, In: *Running a Museum: A Practical Handbook*/ edited by P. Boylan, Paris: International Council of Museums & UNESCO, 2004, p. 51-90

Conservation and preservation literature can often seem to be dominated by huge (and ultimately unachievable) lists of things to do. One can become so busy following parts of this good advice that there is never time to stand back to see if this really is the best way to achieve the fundamental objective of preserving the collection. This chapter therefore adopts a recently developed way of viewing the preservation and conservation of collections as a whole, before focusing in on the details. At the same time, collection preservation remains an intensely practical business in which detailed practical advice is needed alongside this new way of thinking. Therefore this chapter also contains many practical examples and case studies (based on real events or an amalgam of real cases) drawing on the author's experience in surveying and advising museums, large and small, in many countries, including Egypt and Kuwait. Deciding priorities and assessing risks are among the topics discussed.

Climate Change and the Historic Environment

Cassar, May, London: Centre for Sustainable Heritage, university College London, 2005, 104 p.

Commissioned in 2002 by English Heritage, the report and underpinning research provides a view on the potential impact of various climate change scenarios on a range of historic assets over time.

Conservation risk assessment: a strategy for managing resources for preventive conservation

Waller, Robert , In: Preventive conservation practice, theory and research: preprints of the contributions to the Ottawa congress, 12-16 September 1994 / Roy, Ashok (ed.); Smith, Perry (ed.); IIC. London: International Institute for Conservation of Historic and Artistic Works, 1994, p. 12-16, fig., table.

Conservation skills: judgement, method and decision making

Caple, Chris , London: Routledge, 2000 ; XIV, 232 p. : ill. ; 25 cm. ISBN 0-415-18881-4

An overview of the issues facing conservators of historic and artistic works. This extensive work not only describes the nature of conservation but also provides an ethical framework to which the conservation of objects as diverse as 'old masters' to the ephemera of the twentieth century can be related. Drawing on case studies of well- known objects such as the body of the Lindow Man, Michaelangelo's Sistine Chapel frescoes and the Statue of Liberty, the author addresses the following issues: perception, judgment and learning; reasons for preserving the past; the nature and history of conservation; conservation ethics; recording, investigating, cleaning of objects; stabilization and restoration; preventive conservation; decision making and responsibilities.

Cost/benefits appraisals for collection care: a practical guide

Cassar, M.., London: Great Britain Museums and Galleries Commission, 1998.

This book demonstrates how museums can move away from decisions based solely on cost, towards a more balanced assessment of benefits of different decisions. 2 case studies demonstrate the use of cost/benefit appraisals in conservation and collection care decisions.

Covering Your Assets: Facilities and Risk Management in Museums

Merritt Elizabeth E. (ed.); Washington D.C.: American Association of Museums, 2005, 203 p.

Presents the results of a national survey on how museums develop, set and implement policy for facilities use and risk management. Featuring insightful essays on best practices from experts inside and outside the museum field, the book compares and contrasts the very latest data on how museums around the country operate their facilities, manage space and risk, and prepare for emergencies.

Cultural property risk analysis model: development and application to preventive conservation at the Canadian Museum of Nature

Waller, Robert R. , Göteborg: Acta Universitatis Gothoburgensis, 2003 ; XVI, 189 p. : fig., tables ; 28 cm. , (Göteborg Studies in Conservation, 13) , Doctoral Dissertation, Göteborg University. Institute of Conservation, Göteborg, Sweden ISBN 91-7346-475-9, ISSN 0284-6578

A cultural property risk analysis model was developed to guide priorities for resource allocation to preventive conservation under conditions of uncertainty. This model recognizes the preservation system as a subsystem within a collection management system, which, in turns, nests within progressively broader systems. Within this set of
systems and subsystems, the contribution of preventive conservation to the continuance and betterment of humanity is recognized. Carefully defining the scope of the preservation system ensures clear understanding of interactions with surrounding systems. The risk analysis model then disaggregates risk through hierarchies both of sources of risk and of divisions of collections. The level of technical risk analysis varies throughout these hierarchies depending on the potential significance of the disaggregate portion considered. This approach makes the entire modeling process as efficient as possible. This approach is applicable to all forms of cultural property. Its broader adoption will benefit the fields of preventive conservation, conservation research, and cultural heritage management.

Dalla carta di rischio archeologico di Cesena alla tutela preventiva urbana in Europa

Gelichi, Sauro (ed.) / Comune di Cesena. Assessorato all'urbanistica. Cesena, Italy , Firenze: All'insegna del giglio, 2001 ; 118 p. ISBN 19990305-19990306.

Defining suitability of museum galleries by risk mapping

Bradley, Susan , In: *Triennial meeting (14th), The Hague, 12-16 September 2005: preprints* / ICOM Committee for conservation. London: James & James, 2005, p. 574-581, figs., ISBN 1-84407-253-3

In the British Museum, attitudes towards the exhibition of objects in museum galleries are changing. Adaptation of existing galleries can go ahead within tight financial constraints and without a feasibility study phase, limiting the opportunity for conservation specifications to be implemented and creating opportunities for new exhibits without considering preservation needs. To ensure that conservation concerns are taken into account, a gallery risk mapping exercise has been begun at the British Museum. Published

work on risk assessment in conservation which has focused on objects has been adapted to nine environmental factors (temperature, relative humidity, ambient pollutants, particulates, visible light, ultraviolet light, vibration, and insect pests). The outcome will provide planners with the information to design object-friendly galleries.

Developing professional uncertainty

Ashley-Smith, Jonathan , In: *Tradition and innovation: advances in conservation.* Contributions to the IIC Melbourne congress, 10-14 October 2000 / Roy, Ashok; Smith, Perry (ed.); International Institute for Conservation (IIC). London, United Kingdom. London: IIC, 2000, p. 14-17, fig., ISBN 0-9500525-9-0

Hard Sciences such as chemistry contain small but significant areas of unpredictability. Where there is complexity there may be greater unpredictability. This is the case with the relationship between museum collections and their environments. The deterministic laws of science can only be applied to museum objects with great uncertainty, made even greater by the value judgments that drive museum policy. Study of individual objects will lower that uncertainty, but in general a probabilistic approach to future outcomes is the only one that can be used with confidence.

Effective preservation: from reaction to prediction

Waller, Robert; Michalski, Stefan , In: *Conservation: the Getty Conservation Institute newsletter*, Vol. 19, N. 1, 2004, p. 4-9, ills., http://www.getty.edu/conservation/publications/newsletters/19_1/feature.html

Fragments of the world: uses of museum collections

Keene, Suzanne , Oxford: Elsevier Butterworth-Heinemann, 2005 ; X, 198 p. : ills. ; 23,5 cm. , ISBN 0-7506-6472-X

The role of the museum is changing, from object- and collections-centred to people-centred. Further, there are political pressures on museums to make proper use of all their resources, including the stored collections. What then, is the purpose of the collections, besides exhibition? How can we defend their value? What will be the effects of digitization? Should collections be disposed of or dispersed? The book examines these questions using clearly explained cultural theory with examples of collections used for research, learning, memory and identity, creativity and enjoyment, from around the world.

Gestion des risques par l'étude de l'environnement

Arnold, Andreas , In: *Entretien continu du patrimoine culturel contre la pollution fondé sur les actes du séminaire* "Entretien continu du patrimoine culturel contre la détérioration due à la pollution et à d'autres facteurs similaires: évaluation, gestion des risques et sensibilisation du public". Séminaire organisé conjointement par le Conseil de l'Europe et le Riksantikvariämbetet (Direction nationale du patrimoine) / Conseil de l'Europe = Council of Europe. Strasbourg, France. Strasbourg: Editions du Conseil de l'Europe, 2000, p. 55-63, (Patrimoine culturel, n. 40) , ISBN 92-871-4232-7

Group report: paradigms for rational decision-making in the preservation of cultural property Ashworth G.J., Rapporteur , In: *Rational Decision-making in the Preservation of Cultural Property* / edited by Baer N.S. and F. Snickars, Berlin: Dahlem University Press, 2001, p. 277-293. ISBN 3-934504-07-8

Decision-making is a central task in the preservation of cultural property. This chapter explores potential paradigms from which a system of rational decision-making can be constructed. The usefulness of the economic paradigm and economic rationality for this task is considered, especially cost-benefit analysis and utility. This is then compared with other possible approaches, such as decision-making models in bounded rationality, simple marketing paradigms, and risk management strategies. Some practical organizational aspects using decision trees and economic rationalism are introduced. Conclusions are drawn on the implications of a global approach and upon the usefulness of the economic approach.

Group Report: Values and Society

R. Nanda, Rapporteur, In*: Rational Decision-making in the Preservation of Cultural Property* / edited by Baer N.S. and F. Snickars, Berlin: Dahlem University Press, 2001, p. 211-222. ISBN 3-934504-07-8

Preservation of objects and sites of cultural value now involves or influences many actors; in turn, what is preserved, depends on decisions based on “value” criteria. These values are often complex, diverse, continuously evolving, and influenced by society—local and global. In today’s world economy, where interest in cultural heritage transcends national boundaries and where the range of cultural objects and properties has broadened manifold, it is imperative to ensure that preservation decision-makers take into account a variety of factors before concluding on “what” should be preserved and “how.” A sustainable approach

towards preservation coupled by the availability of a platform to share views and the involvement of the public should guide preservation decisions in the future. The future of the preservation movement should be based not on elite ideas but on the involvement of the masses, led by the process of consultation, partnership, and management.

Interfacing research and risk management for a better safeguarding of cultural heritage
Brokerhof, Agnes et al. in *Proceedings of the 7th European Conference "SAUVEUR"*, Safeguarded cultural heritage, Understanding & Viability of the Enlarged Europe, 31st May – 3rd June 2006, Prague, Czech Republic, ITAM, Institute of Theoretical and Applied Mechanics of the Academy of Sciences of the Czech Republic, Volume 2 – Posters, p. 1030 - 1033

Les facteurs quantifiables: la gestion interne du risque
Kleitz, Marie-Odile , In: Biodétérioration et désinfection des collections d'archives et de bibliothèques: actes des deuxièmes journées sur la conservation préventive, Arles, 18 et 19 novembre 1996 / Desproges, Camille (ed.); Arles: Centre de conservation du livre, 1999, p. 64-87. ISBN 2-913624-01-4

Know risk
Jeggle, Terry (*ed.*) / United Nations Inter-agency secretariat of the International Strategy for Distaster Reduction (UN-ISDR). Geneva, Switzerland , Geneva: United Nations ISDR, 2005 ; 376 p. : ills., figs., tables ; 30 cm. , ISBN 92-1-132024-0

Managing conservation in museums
Keene, Suzanne , London: Butterworth Heinemann, 1996 ; XI, 265 p. : fig., tables ; 23 cm. , ISBN 0-7506-2384-5
This book aims to show conservators and other professionals in museums and libraries that professional management information can be as useful to them as is their own specialist expertise. It reviews the climate in which museums operate today, and then describes the most up-to-date and relevant management techniques. The management information techniques which are explained and skeptically reviewed include performance indicators, strategic planning decision making and priority setting, data analysis and presentation, risk and cost-benefit analysis, and information analysis. These are applied to preventive

conservation, work management and conservation planning. In this way, a link is established between the world of professional management and the current priorities and preoccupations of conservators. These are set in the context of the present museum management climate.

Negotiating the climate: a plan for the appraisal of control options in historic houses
Taylor, Joel , In: The conservator, N. 26, 2002, p. 85-92, figs., tables ISSN 0140-0096
A decision making tool for assessing priorities for climate control in historic houses has been piloted at two English Heritage (EH) historic houses. The tool, an environmental management plan (EMP), had been designed by EH to help decision-making regarding control strategy by bringing together all the relevant information and expertise at the same time. The focal point of the EMP is a facilitated meeting between various stakeholders and experts about the importance of the climate issues and the effectiveness of different control options, using a framework based on cost-benefit analysis. This article reports trials of such meetings to reach agreed broad solutions about climate control at Kenwood House and Chiswick House. It is shown that by careful pre-planning, use of a prepared decision matrix and an external facilitator, agreed solutions can be achieved in 1 day. Attention is drawn to the need for the issues affecting the decision to be extremely well defined, and to the importance of negotiation.

Out of the darkness
Keene, Suzanne , In: *Museums journal*, Vol. 105, N. 8, 2005, p. 26-29, ills., ISSN 0027-416X

A paradigm shift for preventive conservation, and a software tool to facilitate the transition
Waller, Robert; Michalski, Stefan , In: *Triennial meeting (14th), The Hague, 12-16 September 2005: preprints / ICOM Committee for conservation*. London: James & James, 2005, p. 733-738, figs., ISBN 1-84407-253-3
Historically, like other industries and agencies that assess and manage risk, conservation adopted a process- control model of preservation. These industries and agencies recognize the process model is fundamentally inadequate and are replacing it with a predictive model based on anticipated risk. Over the past decade, preventive conservation also witnessed the development of systematic and predictive methodologies, but on a somewhat ad hoc basis. This article introduces a more rigorous intellectual framework adapted from the risk

analysis and operations research fields. A comprehensive predictive model is necessarily complex and dependent on large amounts of shared expert knowledge but is possible.

Practical uses of risk analysis

Ashley-Smith, Jonathan , In: *The paper conservator*, Vol. 25, 2001, p. 59-63 ISSN 0309-4227

What distinguishes professional conservators from others who have a practical involvement with historic objects is the reflective nature of their decision-making. Decisions about practical treatments involve elements of

risk: probabilities of unwanted outcomes that reduce the value of the treated object. The continuing development of conservators should be aimed at reducing the uncertainty of decision outcomes by increasing knowledge, and decreasing the uncertainty of action outcomes by increasing practical skill.

Preparación ante el riesgo: un manual para el manejo del patrimonio cultural mundial

Stovel, Herb / UNESCO. World Heritage Centre = Centre du patrimoine mondial. Paris, France / ICCROM. Rome, Italy , Rome: ICCROM, 2003 ; X, 196 p. : ills., tables ; 24 cm. , ISBN 92-9077-182-8

Preserving what is valued

Clavir, M.; Museums, Conservation and First Nations. UBC Press 2002, The University of British Columbia, ISBN

0-7748-0860-8.

Rational Decision-making in the Preservation of Cultural Property

Baer N.S. (ed.); F. Snickars (ed.), Berlin: Dahlem University Press, 2001, 304 p. ISBN 3-934504-07-8

The term value is most often used in the context of relative monetary worth. It is in this context that economists and other social scientists have sought to define the value of such environmental goals as clean air and clean water, leading to concepts of "green values." Yet the terms implies more than simple financial valuation, especially when applied to often intangible public goods, as it also considers the relative place that such goals hold in the choices we as individuals and society as a whole make. Those charged with the stewardship of cultural property, be it an individual document in an archive, an historic landscape or an

entire art city on the World Heritage List, are faced daily with decisions based on often conflicting value systems. It has become obvious that public policy — as determined by such socioeconomic concepts as environmental accounting, cost-benefit analysis, sustainable development, valuation of loss of cultural property, and intergenerational equity — plays a major role in determining what cultural properties will be saved: which books, documents, artifacts, and monuments. So also, public policy determines which portions of our cultural history will be lost to decay and development. In a synthetic approach, an international interdisciplinary group of experts drawn from the social and physical sciences together with specialists from the fields of architectural preservation, museums, and library and archive preservation confronted these issues. The usefulness of “World Heritage” as a planning concept, the mechanisms by which society sets its priorities, the balance between short- and long-term risk factors, the definition of what constitutes the artifact in the information age, and the validity of the application of the value systems of industrialized nations to the cultural property of developing nations are considered in the examination of the applicability of economic and other models to rational decision-making in the preservation of cultural property at the several levels of society and institutions.

Risicoanalyse in Museum Amstelkring, Ons'Lieve Heer op Solder: Wallers "Cultural property at risk analysis model" toegepast op een uniek historisch gebouw en zijn collectie
Muller, Tine , In: *CR: interdisciplinair vakblad voor conservering en restauratie*, Jaargang 5, N. 3, 2004, p. 30-37, ills., ISSN 1566-3876
Museum Amstelkring, Ons'Lieve Heer op Solder and the ICN extensively researched the museum building and its collection to establish the influence of a series of risk factors defined in Robert Waller's Cultural property risk analysis model. His method is based on quantifying chances of risks for different parts of a collection, with the aid of a calculation system. The results show the different risk factors and provide an instrument for management decisions for the complete collections. Ten generic risk factors can be divided into three types: seldom occurring but catastrophic, hardly ever occurring with considerable damage and frequently occurring with only slight damage. Fine tuning these combinations for every part of the collection of Museum Amstelkring gave a result of 58 specific risks, with an explanation how they can occur. It is necessary to establish the value of the different parts of the collection beforehand. These values can be cultural, artistic, historic, functional or emotional. The analysis helps awareness of the knowledge of the collection and omissions. Risk assessment influences management decisions and teambuilding within the

organisation. Risk assessment is an aid for the formulation of procedures within the organisation, for (technical) adjustments that need financial and proposals for further research to fine-tune the calculations.

Risikoabschätzung als Werkzeug der präventiven Konservierung: die Sammlung der Schack- Galerie in München

Herdin, Marcus , In: *Restauro: Zeitschrift für Kunsttechniken, Restaurierung und Museumsfragen,* Jahrgang 109, Heft 6, 2003, p. 400-407, ills., figs., tables, ISSN 0933-4017

Risk assessment is a comprehensive description and assessment of the various damaging factors. The gathered information (data on environment, light, pollutants, etc.) is then evaluated in relation to each other. As an example, risk assessment was conducted for the collection of Adolph Friedrich Graf von Schack, especially built for it in Munich's Prinzregentenstraße, a much traveled and congested street. From a conservation point of view, the building possesses a number of deficits. The heating system cannot be adjusted as needed. Drafty windows make controlling the environment difficult and allow pollutants to enter. The wall-to-wall carpets in the exhibition rooms are dust collectors. The dimming system on the overhead lights is inadequate which means additional unsatisfactory environmental and light conditions for the collection. The main risk factors determined are: environment, light, gaseous and solid air pollutants. Various software and graphs are used to evaluate and demonstrate the measuringresults. The recommendations drawn from the assessment are manifold. For example, dividing the gallery into zonescould stabilize, in particular, the environment in the entrance area. The drafty windows and the entire heating system need attention, respectively the heating system should be replaced with one that provides an even temperature.

Risk assessment for object conservation

Ashley-Smith, Jonathan , Oxford: Butterworth Heinemann, 1999 ; XIV, 358 p. : ill., fig. ; 23 cm., ISBN 07506 28537

This book explains the mechanisms of deterioration of museum artifacts, quantifying the probability that damages will occur and estimating the rate of progress when it does. The principles outlined and the information provided from a foundation for cost-benefit analysis of conservation proposals. It also gives comprehensive explanations of scientific or mathematical material to take into consideration the readers who have no background in

these areas, alongside a basic introduction. The structure of the book provides a logical progression through tools concepts information and examples.

Risk assessment of Museum Amstelkring: application to an historic building and its collections and the consequences for preservation management

Brokerhof, Agnes W.; Luger, Tessa; Ankersmit, Bart; Bergevoet, Frank; Schillemans, Robert; Schoutens, Peter; Muller, Tine; Kiers, Judikje; Muething, Garnet; Waller, Robert , In: *Triennial meeting (14th), The Hague, 12-16 September 2005: preprints* / ICOM Committee for conservation. London: James & James, 2005, p. 590-596, figs., ISBN 1-84407-253-3

Museum Amstelkring is an historic building with a hidden church and mixed collections. It attracts a large number of visitors and the church is still in use. The museum is concerned that it can no longer adequately balance preservation and presentation requirements. ICN was asked to give an integral advice on preventive conservation, visitor impact, and collection management, and to investigate whether building an extension to the museum might ease the pressure on the main building and create better opportunities for the collection. A complete risk assessment and other investigations were carried out to attach objective measures to perceived issues and quantify risks so that their relative importance could be determined. This approach enables museum management to prioritize and make well reasoned decisions about improvements and investments. For museum staff it draws attention to weaknesses in working procedures while for conservation scientists it reveals issues that need further research.

The impact of climate change on cultural heritage: evidence and response

Cassar, May; Pender, Robyn , In: Triennial meeting (14th), The Hague, 12-16 September 2005: preprints / ICOM Committee for conservation. London: James & James, 2005, p. 610-616, figs., ICOM Committee for conservation triennial meeting, 14th, The Hague, Netherlands, 20050912-20050916. ISBN 1-84407-253-3

Risk assessment: a tool to compare alternative courses of action for the conservation of iron-gall ink containing objects

Pedersoli, José Luiz, Jr; Reißland, Birgit , In: *Restaurator: international journal for the preservation of library and archival material*, Vol. 24, N. 4, 2003, p. 205-226, tables, ISSN 0034-5806

A framework for the quantitative estimation of the risks associated with possible courses of action for the conservation of iron-gall ink containing paper objects has been developed. It includes the identification of all possible undesired effects resulting from each course of action, followed by the estimation of the probability that a given undesired effect will occur, as well as of the loss of value it would lead to. Four alternative courses of action were considered in this study: 1) no action, 2) preventive conservation, 3) combined calcium phytate/calcium bicarbonate treatment and 4) paper splitting. Because the magnitude of risk closely depends on the condition of a particular object, it is suggested that risk assessment for entire collections should be preceded by dividing the collection into sub-group of objects having similar condition. By quantifying the risks involved in different possible scenarios, a comparison among conservation alternatives may become more objective, and decision-making is likely to be based on a better informed judgement.

Risk management at the Fitzwilliam Museum, Cambridge

Greeves, Margaret , In: *Journal of architectural conservation*, Vol. 7, N. 3, 2001, p. 67-79, ills., ISSN 1355-6207

The Fitzwilliam Museum, Cambridge, is a Grade I listed building housing an internationally important art collection of half a million objects. The building and the collections belong to the University of Cambridge, of which the museum forms a department. Maintenance of the fabric and equipment is the responsibility of the university's Estate Management and Building Service, with whom museum staff work closely to ensure appropriate conditions for the collections and the reduction of risks objects and staff. Following the drafting of a conservation plan and an examination of risks and their management, this case study reviews the museum's risks. It proposes the development of a building bible and attention to staff communication as essential elements of the risk management strategy it outlines. A second paper will examine the effectiveness of the conservation plan in relation o maintenance works and an extension of 3,000 square meters, which will be built in 2002-3.

Risk management by environmental monitoring

Arnold, Andreas , In: *Sustained care of the cultural heritage against pollution*. Based on the seminar entitled "Sustained care of the cultural heritage against deterioration due to pollution and other similar factors: evaluation, risk, management and public awareness". Seminar organised jointly by the Council of Europe and the Riksantkvarieämbetet (National

Heritage Board) / Council of Europe = Conseil de l'Europe. Strasbourg, France. Strasbourg: Council of Europe Publishing, 2000, p. 53-61, Cultural heritage, n. 40. ISBN 92-871-4233-5

Risk management of digital information: a file format investigation

Lawrence, Gregory W.; Kehoe, William R.; Rieger, Oya Y.; Walters, William H.; Kenney, Anne R. / Council on Library and Information Resources. Washington, United States , Washington, D.C.: Council on Library and Information Resources, 2000 ; VIII, 75 p. : tables ; 28 cm. , ISBN 1-887334-78-5

Risk management, value and decision-making

Baer, Norbert S., In: *The paper conservator*, Vol. 25, 2001, p. 53-58 ISSN 0309-4227

In over three decades of teaching at the Conservation Center of the Institute of Fine Arts, New York, the author has explored a number of organizing principles to synthesize the vast body of materials science encountered in the conservation of cultural property. Among these has been the concept of risk management as defined by various committees of the National Academy of Sciences. This led logical to the question of value and values. In the recent past, the author has engaged in interdisciplinary dialogue with economists, mathematicians and political scientists, considering mechanisms of decision-making in the preservation of cultural property. Using selected examples drawn from the assignments the author has given his students, the evolution in his teaching methods and the parallelevolution of the discipline of conservation are examined.

Risk map: a project to aid decision-making in the protection, preservation and conservation of Italian cultural heritage

Accardo, Giorgio; Altieri, Antonella; Cacace, Carlo; Giani, Elisabetta; Giovagnoli, Annamaria , In: *Conservation science 2002*: papers from the conference held in Edinburgh, Scotland 22-24 May 2002 / Townsend, Joyce H. (ed.); Eremin, Katherine (ed.); Adriaens, Annemie (ed.); London: Archetype Publications, 2003, p. 44-49. ISBN 1-873132-88-3

The Risk Map of Cultural Heritage is a current research project of Istituto Centrale del Restauro (ICR) which was undertaken in order to plan in a more rational and economical way the maintenance, conservation and restoration of architectonical and archaeological monuments of Italian cultural heritage. The first step of the project was to produce a Geographic Information System (GIS), which works as a data processing centre and is located in the Physics Laboratory of ICR. The GIS collects, processes and manages both

cartographic and alphanumerical data, generated from the peripheral units based in many Italian towns - Soprintendenze - which are territorial departments of the Ministry of Culture. The connection between environmental danger in the territory and the risk situation for the monument can be highlighted more specifically through a mapping process, i.e. the overlapping of computerised maps with information content (air pollution, climate, earthquake, etc.) and the distribution of cultural assets. The second step was to ensure that the data mentioned above were homogeneous through the definition of standardised schedules at different levels of detail. The schedules concern information both on the environment and the conservation state of the monuments.

A risk model for collection preservation
Waller, Robert , In: *Triennial meeting (13th), Rio de Janeiro, 22-27 September 2002*: preprints / ICOM Committee for conservation. London: James & James, 2002, p. 102-107, figs., table. ISBN 1-902916-30-1

Sharing responsibility for conservation decisions
Michalski, Stefan, In: Durability and change: the science, responsibility, and cost of sustaining cultural heritage. Report of the Dahlem workshop..., December 6-11, 1992 / Krumbein, Wolfgang E. (ed.); Brimblecombe, Peter (ed.) ;

Cosgrove, Denis E. (ed.); Staniforth, Sarah (ed.) , Chichester: John Wiley, 1994, p. 241-258., Berlin, Germany, ISBN
0-471-95221-4

Significance: a guide to assessing the significance of cultural heritage objects and collections Russell, Roslyn; Winkworth, Kylie / Heritage Collections Council. Canberra, Australia , Canberra: Heritage Collections Council, 2001 ; 72 p. : ill. ; 29,5 cm. ISBN 0-642-75094-7

Sustainability and precaution, part 2: how precautionary should we be?
Ashley-Smith, Jonathan , In: *V & A conservation journal*, N. 44, 2003, p. 2-3, ISSN 0967-2273
http://www.vam.ac.uk/res_cons/conservation/journal/number_44/sustainability-precaution-2/index.html

Teaching risk management of collections internationally

Antomarchi, C.; Brokerhof, A; Michalski, S.; Verger, I.; Waller, R. R. , In: *Collections: a journal for museum and archives professionals* / Vol. 2, N. 2, November 2005, p. 117-140. ISSN 1550-1906

Risk assessment and the purpose it serves, risk management, are widely adopted by business, institutions, and governments, seeking to minimize future losses of all kinds. If the preservation goal of museums is stated as the delivery of the collection to some future point in time with as little loss in value as possible, then risk assessment and risk management provide the only rational means to reach this goal. Difficulties arise due to uncertainty and complexity. A three-week course on this method has been designed, and recently offered, by ICCROM (the International Center for the Study of the Preservation and Restoration of Cultural Property) and the Canadian Conservation Institute (CCI), with the collaboration of leading experts from the Canadian Museum of Nature (CMN) and the Netherlands Institute for Cultural Heritage (ICN). Demand for the knowledge was strong, a shown by the number and diversity of applicants worldwide. Great care and effort was taken with the design of the learning process and the supporting resources, in order to overcome the known, and profound, challenges of the subject. The result has been successful.

Valuing Cultural Heritage, Applying Environmental Valuation Techniques to Historic Buildings, Monuments and Artifacts

Navrud, Stale and Ready, Richard C. (eds.), Edward Elgar Publishing Limited, Cheltencham, 2002

What value do we place on our cultural heritage, and to what extent should we preserve historic and culturally important sites and artefacts from the ravages of weather, pollution, development and use by the general public? This innovative book attempts to answer these important questions by exploring how non-market valuation techniques – used extensively in environmental economics – can be applied to cultural heritage. The book includes twelve comprehensive case studies that estimate public values for a diverse set of cultural goods. The authors demonstrate the potential utility of these techniques, and highlight the important social values that cultural heritage can generate. Given limited resources, such studies can help set priorities and aid the decision making process in terms of their preservation, restoration and use. The authors conclude by reviewing the majority of cultural valuation studies done to date, and draw some general conclusions about the results

achieved and the potential benefits, as well as the limitations, of valuing these types of goods. This highly original book will be of great use and interest to academics in the fields of environmental, resource, and cultural economics, as well as NGOs and policymakers involved in cultural heritage at the national, international and global level.

Valuation model for paper conservation research: a new approach for setting research priorities

Porcl, H.J., Ligterink, F.J., de Bruin, G. and Scholten S.,in *Preservation management for libraries, archives and museums*, edited by Gorman, G.E. and Shep S.J., Facet Publishing, 2007. xviii, p. 83-96. 206 p. ISBN 1-85604-574-9

The Value and Valuation of Natural Science Collections

Nudds, J. R. and Pettitt, C. W., eds./ *Proceedings of the International Conference*, Manchester, 1995.; Manchester, U.K. London, U.K.: The Geological Society; 1997; c1997: p. 211-214. 276 p. ISBN: 1-897799-76-4.

Values and heritage conservation: research report

Avrami, Erica (ed.); Mason, Randall (ed.); Torre, Marta de la (ed.) / Getty Conservation Institute. Los Angeles, United States , Los Angeles: Getty Conservation Institute, 2000 ; 96 p. : 27,5 cm.

http://www.getty.edu/conservation/publications/pdf_publications/valuesrpt.pdf

Why is risk assessment / risk management important to conservation = L'importance de l'évaluation des risques et la gestion des risques en conservation

Inch, Jeanne in CCI newsletter = Bulletin de l'ICC, 36, 2005, No of p. 6, ISSN: 1180-3223

The article discusses the use of risk assessment and risk management, currently being used by government and business as a decision-making tool. The museum community is turning to risk assessment of collections to help the institutions set priorities and infrastructure to protect their collections. It describes the work being done at CCI with courses given with ICCROM in 2005 in Rome and to be held in Ottawa in October 2006 entitled "Preventive conservation: reducing risks to collections".

C. Risk management within the heritage field - specific to emergency preparedness

Books and articles

Building an emergency plan: a guide for museums and other cultural institutions

Dorge, Valerie (comp.); Jones, Sharon L. (comp.) / Getty Conservation Institute. Los Angeles, United States , Los Angeles: Getty Trust Publications, 1999 ; VIII, 208 p. : ill. ; 28 cm. , ISBN 0-89236-551-X

http://www.getty.edu/conservation/publications/pdf_publications/emergency_plan.pdf

Community-based disaster risk management: integration to socio-economic development process & Field practitioners' handbook

Asian Disaster Preparedness Center (ADPC)/ ADPC, Bangkok, 2004.

Developing state-wide emergency and disaster preparedness expertise

Watkins, Stephanie , In: *Journal of the American Institute for Conservation*, Vol. 39, N. 1, 2000, p. 165-172, ISSN 0197-1360

The Federal Emergency Management Agency (FEMA) has developed an emergency response training program, which is divided into five sections: orientation, drill tabletop, functional, and full-scale. Each section provides skills that are expanded through subsequent exercises. Suggestions are given for implementing the FEMA training model to the needs of cultural institutions. The Missouri Local Records Preservation Program's archivists were trained in emergency preparedness and response methods for books, papers, photographs, and electronic media by adapting FEMA's model. This article concludes with resources for developing similar training programs.

Don't take the risk! A management plan can prevent disaster = Évitez les risques grâce à un plan de gestion

Turner, Susan D. , In: Heritage = Patrimoine, Vol. 6, N. 2, 2003, p. 24-25 (English), 24-25 (French), ills., ISSN 1480-6924

Help! A Survivor's Guide to Emergency Preparedness Museums Alberta Museum Excellence Series: Book 3

Ball, Cynthia & Yardley-Jones, Audrey (eds), (Edmonton: Museums Alberta), 2001.

Planning for disaster

Linnerooth-Bayer, Joanne / International institute for applied systems analysis (IIASA). Laxenburg, Austria , In: *Options*, , Summer (2006), p. 18-19, ill.,

Can natural disasters be avoided and their consequences made less catastrophic? If so, how can we measure which preventive actions are most effective and efficient? These questions are critical to developing countries that find themselves particularly vulnerable to natural disasters and their effects. A series of IIASA studies highlight how countries and people can make themselves not only more secure against natural disaster but also less vulnerable to their consequences. Three approaches to assess disaster management are presented: cost-benefit analysis (CBA); the IIASA CATSIM model; model-based participatory processes for assessing risk financing options.

Preparing for the worst, planning for the best: protecting our cultural heritage from disaster.

Proceedings of a conference sponsored by the IFLA preservation and conservation section, the IFLA Core Activity for Preservation and Conservation and the Council on Library and Information Resources, Inc., with the Akademie der Wissenschaften and the Staatsbibliothek zu Berlin, Berlin, Germany, July 30-August 1, 2003 Wellheiser, Johanna G. (ed.); Gwinn, Nancy E. (ed.) / International Federation of Library Associations and Institutions IFLA. Den Haag, Netherlands / Council on Library and Information Resources (CLIR). Washington, United States , München: Saur, K.G., 2005 ; 192 p. : ills. ; 21, 5 cm. , (IFLA publications, 111). ISBN 3-598-21842-7

Proceedings of a conference held by the International Federation of Library Associations and Institutions (IFLA) on disaster preparedness and recovery. The publication consists of sixteen papers divided into six sections that cover: national policy planning, efforts by the International Committee of the Blue Shield (ICBS), institutional planning, case studies of disaster preparedness and recovery, example cases of risk assessments, and methods for conserving and restoring damaged collections. Cases cover a wide geographical area in addition to a broad range of themes, such as psychological repercussions of the destruction of cultural property, lessons learned from natural disasters, and mitigation measures organisations can take to minimise risk and damage. Chapters are applicable to any collecting institution.

Risk preparedness for cultural properties: development of guidelines for emergency response. 1997 Kobe/Tokyo international symposium
Saito, Hidetoshi (ed.) , Tokyo: Chuo-Koron Bijutsu Shuppan, 1999 ; [24], 499 p. : ill. . ISBN 4-8055-0370-X

Risk preparedness: a management manual for World Cultural Heritage
Stovel, Herb / ICCROM. Rome, Italy / UNESCO. Paris, France, Rome: ICCROM, 1998 ; 145 p. : ill. ; 24 cm. , ISBN 92-9077-152-6

Significance, A Guide To Assessing The Significance Of Cultural Heritage Objects And Collections Commonwealth of Australia 2001 on behalf of the Heritage Collections Council. http://sector.amol.org.au/publications_archive/museum_management/significance

D. Risk Information by agent of deterioration

1. Physical forces - general

Books and articles

Earthquake risk assessment - a short guideline

Swiss reinsurance company , Zurich: Swiss reinsurance company, 1982 ; 50, ill., 30 cm ,

Aspects and factors of seismic risk assessment: a short guide to the evaluation of earthquake risks in relation with: zone, subsoil, building material, regularity of buildings, sensitivity, design material workmanship, fire exposure.

Evaluation of earthquake damage mitigation methods for museum objects

Agbabian, Mihran S.; Ginell, William S.; Masri, Sami F.; Nigbor, Robert L. , Marina del Rey, California: Getty Conservation Institute, s.d. ; 20 p. 4 pl. ; 28 cm.

Discusses procedures for the evaluation of some of the earthquake damage mitigation methods in use or under development in the J. Paul Getty Museum. Generic models for various categories of objects were formulated and analytical techniques have been devised that allow the assessment of the susceptibility of objects to rocking, overturning, sliding, and stress failure when subjected to earthquake-induced forces. Failure criteria are discussed and examples of categories of mechanical methods reducing transmitted forces are given. Experimental verification of some of the analytical formulations have been undertaken on object models using sine, swept sine, and simulated earthquake accelerogram inputs to laboratory-scale shake tables. The conception and ideas given are generally applicable to other museums and cultural heritage repositories.

Mount-making for museum objects

Barclay, Robert L.; Bergeron, André; Dignard, Carole; Schlichting, Carl (ill.) Ottawa: Canadian Conservation Institute, 1998 ; 57 p. : fig., ill. ; 23 cm. , ISBN 0-660-17531-2

Seismic stabilization of historic adobe structures

Ginell, William S.; Tolles, E. Leroy , In: Journal of the American Institute for Conservation, Vol. 39, N. 1, 2000, p. 147-163, fig., tables, ISSN 0197-1360

1. Physical forces - Collections in transit

Books and articles

Art in transit. Handbook for packing and transporting paintings

Richard, Mervin; Mecklenburg, Marion F.; Mervill, Ross M. , Washington, DC: National Gallery of Art, 1991 ; Pagination multiple : figs., 29 cm , ISBN 0-89468-165-6

Handbook describing procedures that will enable packers, registrars, curators and conservators to effectively use the results of the research of specialists in the field of art in transit, in particular in the packing and shipping of paintings. The handbook is divided into 10 sections : assessing risks, transit climate conditions, temperature protection, relative humidity protection, shock and vibration hazards, shock protection, vibration protection, packing cases, role of the courier, glossary. This handbook serves as a companion to the publication "art in transit : studies in the transport of paintings" (Proceedings of the International conference on the packing and transportation of paintings, London, 9-13 Sept. 1991.)

A Circular Slide Rule for Protective Package Design

Marcon, Paul J.; Mecklenburg, Marion F. (ed.) , In: *Art in Transit: Studies in the Transport of Paintings*, Washington, DC: National Gallery of Art, 1991, p. 14. ISBN 0-89468-163-X

One of the greatest hazards an item will face during shipment is potentially damaging levels of shock. Some of the most severe shocks that are likely to occur during shipment are usually the result of accidental drops or mishandling. Routine handling operations such as stacking, loading, and unloading can also produce significant and potentially harmful levels of shock. In order to protect items from damage, design procedures and performance data for cushioning materials are available for use. The design procedures involve using tables, interpreting graphs, and performing repetitive calculations. The circular slide rule, described in this paper is based on common design methods and procedures, and frees an art packer from the tasks mentioned above. With the help of the slide rule, a packer can quickly select a cushioning material that will provide a quantifiable level of shock isolation by dialing the weight of a package the weight of the object to be packed, and the objects surface area. This paper provides a description of the slide rule and sample applications for its use.

Mechanical Risks to Large paintings such as Guernica during Transit

Michalski S., Marcon P, In: *El Guernica y los problemas eticos y tecnicos de la manipulation de obras de arte*, Fundación Marcelino Botín. Santander, Spain, 2002 ;p. 87-98

Contains useful fragility data for paintings on canvas, in terms of the maximum drop they will tolerate before suffering damage. Also provides estimates on what diameter very large paintings can be rolled without risk of cracking.

Packing and transport of hollow plaster sculpture

Marcon, Paul J.; Harrington, Michael; Heinrichs, Paul; Couture-Rigert, Doris , In: *Triennial meeting (12th), Lyon, 29 August-3 September 1999: preprints. Vol. 1* / ICOM. Committee for conservation . London: James & James, 1999, p. 77-82,. ISBN 1-873936-92-3

Protective packaging strategies for the safe shipment of 35 fragile hollow plaster sculptures are described. These include a multi-criteria decision method, based on size, geometry, and surface finishes, that was used to rank- order sculpture vulnerability; double-case designs that simplified the protective packaging for the irregular-shaped sculptures; and several variations of the inner-case component of the double-case design that provided ease of handling and added protection for the fragile plaster works during display installation and removal. Effective material use and other benefits provided by the double-case package designs are discussed, and features that contribute to the optimum performance of a double-case system are presented.

Shock, vibration, and the shipping environment

Marcon, Paul J. , In: *Art in transit: studies in the transport of paintings. Proceedings of the International Conference on the packing and transportation of paintings. September, 9,10, and 11, 1991,* London. Edited by Mecklenburg, Marion F. / Washington, DC: National Gallery of Art, 1991, p. 121-132, Figures, ISBN 0-98468-163-X

The shipping environment has been studied by the packaging field, military and resource organizations. As a result, substantial information on shipping hazards is available that can be applied to art shipments and artifact fragility test procedures. The following provides an overview of the shock and vibration inputs to package during shipment, the sources of these inputs, magnitude. Aspects of the shipping environment that are well defined are identified as well as areas where further research is required.

Websites

APA The Engineered Wood Association.

Wide range of publications, many free in .PDF format http://www.apawood.org/level_b.cfm?content=pub_main

See http://www.apawood.org/pdfs/managed/M200A.pdf for an excellent guide that includes practical information and step-by step instructions for fabricating large wooden shipping containers. APA – materials handling guide

Drop-N-Tell

A web search of "Drop-N-Tell" will reveal a number of potential suppliers. Indicators and be purchased with the following sensitivities. Resettable indicators are best for demonstration purposes. Non-resettable units are intended for package monitoring. Indicator sensitivities: 5, 10, 15, 25, 50 along one axis only. Omni-G http://www.chatsworthdata.com/impact-o-graph/indicators.htm, fixed G ranges from 2 G to 300 G. The indicators are a bit bulkier than the drop-n-tells but they are sensitive to shocks in all directions. They are a good choice for demonstrations and package testing applications.

IoPP (Institute of Packaging Professionals).

http://www.iopp.org

Many other packaging organizations also publish information on the web.

PadCad, Canadian Conservation Institute

A 30 day trial version of PadCAD, a computer program can be downloaded at http://www.cci-icc.gc.ca/whats- new/padcad-download_e.shtml

See http://www.cci-icc.gc.ca/whats-new/newsletter_e.shtml, Newsletter No.22 for packaging articles.

2. Thieves and vandals

Books and articles

Museum security and protection: a handbook for cultural heritage institutions

Liston, David (ed.) / ICOM. Paris, France / International Committee on Museum Security , London: Routledge, 1993 ; XIII, 319 p. ISBN 0-415-07509-2

Security hardware and security system: planning for museums

Kelly, Wayne , In: *Canadian Conservation Institute technical bulletin*, N. 19, 1998, p. 1-16, fig., ISSN 0706-4152

Theft and vandalism of our cultural collections is escalating every year. This publication is intended to help managers of cultural institutions to better their preparations against the ever-increasing threat of theft and vandalism. Numerous, inexpensive methods of improving security protection and various types of currently available sensors and computerized alarm systems are illustrated and described. Various types of sensors and their placement within a standardized level of protection proposed for each area in a cultural facility are also recommended.

Website
Museum-security
http://www.museum-security.org/indexdefinitief.html

3. Fire
Books and articles

A decision logic for trading between fire safety measures
Harmathy, T.Z. et al, In: *Fire and Materials*, 14, 1989, p. 1-10.

An Introduction to Fire Detection, Alarm, and Automatic Fire Sprinklers
Artim, Nick. In: *Preservation of library & archival materials: a manual*, Ogden, Sherelyn (ed.) / Northeast Document Conservation Center. Andover, Massachusetts, United States - 3rd rev. and enlarged ed. 1999 ; ISBN 0- 963-4685-2-9

Automatic Sprinkler Systems for Museums (also in French)
Baril, P. In: *CCI Note* No. 2/8. Ottawa: Canadian Conservation Institute, 1998.

Can you stand the heat? A fire safety primer for libraries, archives, and museums
Trinkley, Michael, Atlanta: Solinet Conservation Services, 1993 ; VII, 70 p. : fig. ; 23 cm. ,
Responsible stewardship of our collections requires that all collections-holding repositories take seriously the risk of fire and engage in planning designed to protect not only the collections, but also - and even more importantly - human life. This paper is written to provide libraries, archives, and museums with an introduction to fire safety in simple, easy to understand terms. The nature of fire, its destructive powers, and how it typically affects both staff and patrons are briefly discussed. Detailed explanations are offered of all the fire

detection and suppression devices typically used in repositories, and their features and benefits are analyzed. The paper also stresses the importance of conducting periodic fire safety inspections and outlines the necessary elements of a fire safety programme for an institution.

Considering fire-safety improvements to historic buildings
Kaplan, Marilyn E. , In: *APT bulletin*, Vol. 34, N. 4, 2003, p. 10-17, tables, ISSN 0044-9466
AA : Technical and analytical advances have created the potential for unprecedented levels of fire safety to be achieved in buildings. Installations must be carefully considered, given the potentially significant physical impact they have on historic spaces and features. Solutions should be selected based on a building's unique hazards, the long-term cost and life expectancy of a system, and the appropriateness of considering alternate or additional fire-safety means achieved by fire prevention backed by rigorous management policies.

Evaluation des risques d'incendie dans les bâtiments patrimoniaux à Winnipeg = Fire risk assessment for heritage buildings in Winnipeg
Bugailiskis, Giles; Wagner, Jim; Richardson, Ken , In: Heritage = Patrimoine, Vol. 7, N. 2, 2004, p. 27-29 (French), 27-29 (English), ills., ISSN 1480-6924

The fire at the Royal Saskatchewan Museum, part 1: salvage, initial response, and the implications for disaster planning. Part 2: removal of soot from the artifacts and recovery of the building
Spafford-Ricci, Sarah; Graham, Fiona , In: *Journal of the American Institute for Conservation*, Vol. 39, N. 1, 2000, p. 15-56, fig., ISSN 0197-1360

Fire prevention programs for museums
Baril, Paul , In: *Canadian Conservation Institute Technical Bulletin*, n. 18, 1997, p. 1-12, fig., ISSN 0706-4152
Fire damages and destroys Canadian collections every year. This Technical Bulletin is intended to help museums develop and implement effective fire prevention programmes. It describes the ways and means to develop and implement a successful, comprehensive, yet not overbearing programme. Numerous examples are provided to help museum staff prepare documents and procedures.

Fire Protection Issues for Historic Buildings (also in French)
Baril, P. In: *CCI Note* No. 2/6. Ottawa: Canadian Conservation Institute, 1998.

Fire Protection Measures for the Royal Palaces
Bailey, Sir Alan, Insall, Donald and Philip Kilshaw. (Report). London: Department of National Heritage, May 1993.

Museum Fires and Losses (also in French)
Baril, P. In: *CCI Note* No. 2/7. Ottawa: Canadian Conservation Institute, 1998.

NFPA 13. Installation of Sprinkler Systems.

NFPA 13A. Inspection, Testing and Maintenance of Sprinkler Systems. NFPA 232A. Guide for Fire Protection for Archives and Record Centers NFPA 750. Water Mist Fire Protection Systems.

NFPA 909. Code for the Protection of Cultural Resources

NFPA 914. Fire Protection of Historic Structures.
National Fire Protection Association. Quincy, MA, United States.

Principaux risques d'incendies dans les musées: quelques règles de prudence
Calas, Jean-Marie , In: *Prévention 2000: la prévention des sinistres dans les aires de stockage du patrimoine, Draguignan - Figanières, 7-10 novembre 2000 = Prevention 2000: prevention of disasters in cultural storage areas, Draguignan - Figanières, 7-10 November 2000* / Rebière, Jacques (ed.); Mourey, William (ed.); Centre archéologique du Var. Draguignan, France. Draguignan: Centre archéologique du Var. Laboratoire de conservation, restauration et recherches, 2003, p. 175-177. ISBN 2-905757-01-9
This paper recaps some administrative and practical measures to avoid fire in buildings where cultural heritage is preserved. The necessary cooperation between curators, conservators and security specialists for the choice and management of alarm systems and fire fighting methods adapted to the building's configuration is emphasized.

The treasury building fire of 1996: protecting cultural resources in a non-museum environment

Mohr, Paula A. , In: *Journal of the American Institute for Conservation*, Vol. 39, N. 1, 2000, p. 57-63, fig., ISSN 0197-1360

4. Water

Books and articles

Disaster recovery at the University of Alberta, or, every flood has a silver lining

Ellis, Shirley , In: *Journal of the American Institute for Conservation*, Vol. 39, N. 1, 2000, p. 117-126, table, ISSN 0197-1360

Disaster recovery of modern information carriers: compact discs, magnetic tapes, and magnetic disks

Iraci, Joe , In: *CCI Technical bulletin*, N. 25, 2002, p. 1-15, ills., figs., ISSN 0706-4152

This bulletin summarizes some procedures for the disaster recovery of modern information carriers such as CDs, magnetic diskettes, and magnetic tapes following immersion in tap water, seawater, and dirty water. Procedures are also given for dealing with media that have hard-to-remove deposits on them or have been exposed to heat, dust/dirt, mould, and shock. These procedures are a compilation of information from the few case histories published.

Emergency Treatment of Water-Damaged Paintings on Canvas

CCI Note 10/5, revised July 1996. Ottawa: Canadian Conservation Institute

Freeze-drying Vellum

Parker, Tony, In: *Library Conservation News*, (London: British Library), October 1991, no.33, p. 4 - 6.

Midnight in the garden of soggy and damp: the New Years's Eve disaster at the Virginia Historical Society

Rusch, Stacy; Herro, Holly , In: *Journal of the American Institute for Conservation*, Vol. 39, N. 1, 2000, p. 127-134, fig., table, ISSN 0197-1360

On New Year's Eve 1993, a burst fire-suppression pipe flooded the Virginia Historical Society with 8,000 gallons of water. Unprocessed manuscripts, rare books, general

collections materials, portraits, museum objects, and furniture were affected. The staff, assisted by the Virginia Conservation Association, Chubb Insurance personnel, and Servpro, responded quickly. The book collections were treated in various ways, including freeze-drying, and rehousing. Some items were repaired at the historical society; others were sent to outside contractors for drying and conservation. The process of recovery and rehabilitation of the collection required 1,222,5 staff and volunteer hours and 10 months for completion. The final cost was $76,000. The article discusses recommendations and procedures learned from this experience that will benefit other instructions.

An ounce of prevention: integrated disaster planning for archives, libraries, and record centres Wellheiser, Johanna; Scott, Jude - 2nd. ed. , Lanham, Maryland: Scarecrow Press, 2002 ; XVI, 284 p. ; 28 cm. , ISBN 0-8108 4176-2

A Primer on Disaster Preparedness, Management and Response: Paper-based Materials National Archives & Records Administration. October 1993: http://www.archives.gov/preservation/pdf/primer_disaster_preparedness.pdf]

Salvage and recovery of water, fire and smoke damaged library buildings and their contents Fischer, Mark W.A., In: *Redefining Disasters: A Decade of Counter-Disaster Planning*, Preprints (Sydney: State Library of New South Wales), 1995, p.59 - 64.

Salvage of fire-damaged collections
Collins, Grant, in: *Redefining Disasters: A Decade of Counter-Disaster Planning, Preprints* (Sydney: State Library of New South Wales), 1995, p. 41 - 46.

Vacuum freeze-drying of paper-based materials
Fischer, Mark W.A., In: *Redefining Disasters: A Decade of Counter-Disaster Planning*, Preprints (Sydney: State Library of New South Wales), 1995, p.65- 68.

Websites
American Institute for Conservation
http://aic.stanford.edu/library/online/disaster/tentip.html

Conservation center for art and historic artefacts

http://www.ccaha.org/disaster.html

Conservation on line
http://palimpsest.stanford.edu/byauth/tremain/coated.html
http://palimpsest.stanford.edu/byorg/nps/npsafter.html
http://palimpsest.stanford.edu/waac/wn/wn10/wn10-2/wn10-202.html

Library of congress
http://www.loc.gov/preserv/emerg/dry.html

Museum-Security
http://www.museum-security.org/indexdefinitief.html

National Archives & Records Administration
http://www.archives.gov/preservation/emergency-prep/lessons-learned.html
See proceedings of the 17th Annual Preservation Conference, March 21, 2002, especially articles by Brothers, Peter. Damage Mitigation and Recovery: Magnetic Media; Ludwig, Kathy. Efficacy of Various Recovery Techniques; Markham, Roger. Recovery of Film; Page, Susan. Fire Recovery: A Case Study; Podany, Jerry. Objects Recovery,

North East Document Conservation Center Technical leaflets:
http://www.nedcc.org/plam3/tleaf38.htm
http://www.nedcc.org/plam3/tleaf37.htm
http://www.nedcc.org/plam3/tleaf39.htm

5. Pests
Books and articles

Controlling insect pests with low temperature (also in French)
Strang, T., In: *CCI Note* No. 3/3. Ottawa: Canadian Conservation Institute, 1997.

Controlling vertebrate pests in museums = La lutte contre les vertébrés nuisibles dans les musées

Strang, Thomas J. K.; Dawson, John E. , In: Canadian Conservation Institute Technical bulletin = Institut Canadien de Conservation Bulletin technique, n. 13, 1991, p. 1-9 (English), 1-11 (French), ISSN 0706-4152

When vertebrate animals, particularly rodents, gain access to museum collections, they can soil or destroy artifacts. Prompt identification of the pest and the use of suitable methods to control it are essential. In most cases, nonchemical methods can be used to control vertebrate pests in museums; chemical methods are also
discussed.

A guide to museum pest control

Zycherman, Lynda A. (ed.); Schrock, John Richard (ed.) / American Institute for Conservation of Historic and Artistic Works. Foundation , Washington, District of Columbia. Association of Systematics Collections, 1988, 205 p. , ISBN 0-942924-14-2

An American manual on pest control on museums provideing information updated to 1986. Topics were organized in four sections. 1) Policy, law and liability: includes a summary of the 1980 Fumigation Conference and update on USA regulation, statutes and liabilities. 2) Pest and pest identification: includes a guide to pests and their targets with detailed information on cockroaches, wood-infesting coleoptera, dermestid, and anobiid beetles. 3) Treatment: contains a glossary of pesticides, articles on uses and effects of pesticides, articles on uses and effects of pesticides, insecticides, fumigant hazards and on minimizing use of chemical measures. 4) References: includes an extensive bibliography and index on pest control literature.

Insect trapping: the key to pest management

Pinniger, David B.; Blyth, Valerie; Kingsley, Helen, In: *Third Nordic symposium on insect pest control in museums, Stockholm, 24-25 September 1998: proceedings* / Akerlund, Monika (ed.); Bergh, Jan-Erik (ed.); Stenmark, Arnold (ed.); Wallenborg, Irma (ed.); Naturhistoriska riksmuseet. Stockholm, Sweden. Stockholm: 1998, p. 96-107

Museums and historic houses reduce the risk of pest damage by adopting insect pest management (IPM) programme. This will include: monitoring for pests, modifying the environments to discourage pest attack and targeting treatment only where it is needed. This paper discusses the key IPM component of trapping. Many different traps are available, the most effective are simple sticky blunder traps. Traps with pheromone lures can be effective against a known target species.

Integrated pest management for collections: proceedings of 2001: a pest odyssey, a joint conference, London, 1-3 October 2001

Kingsley, Helen (ed.); Pinniger, David B. (ed.); Xavier-Rowe, Amber (ed.); Winsor, Peter (ed.) / English Heritage.London, United Kingdom / Science Museum. London, United Kingdom / National Preservation Office. London, United Kingdom , London: James & James, 2001 ; 156 p. . ISBN 1-85074-802-0

Nonchemical treatment processes for disinfestation of insects and fungi in library collections Wellheiser, Johanna G. , München: K.G. Saur, 1992 ; VIII, 118 p. ; 21 cm. , (International Federation of Library Associations and institutions publications, 60) , ISBN 3-598-21788-9

Pest management in museums, archives and historic houses

Pinniger, David B.; Townsend, Annette (ill.), London: Archetype, 2001; IX, 115 p.: ills. ; 23,5 cm. , ISBN 1-873132- 86-7

Preventing infestation: Control strategies and detection methods (also in French)

Strang, T., In*: CCI Note* No. 3/1. Ottawa: Canadian Conservation Institute, 1997.

Principles of heat disinfestations

Strang, T. , In: *Integrated pest management for collections: proceedings of 2001: a pest odyssey, a joint conference, London, 1-3 October 2001* / Kingsley, Helen (ed.); Pinniger, David B. (ed.); Xavier-Rowe, Amber (ed.); Winsor, Peter (ed.) / English Heritage. London, United Kingdom / Science Museum. London, United Kingdom / National Preservation Office. London, United Kingdom , London: James & James, 2001, p. 114-129. ISBN 1-85074-802-0

Solarization: a cheap but effective method to disinfest museum objects

Brokerhof, Agnes W. , In: *Triennial meeting (13th), Rio de Janeiro, 22-27 September 2002: preprints* / ICOM Committee for conservation. London: James & James, 2002, p. 15-20, ISBN 1-902916-30-1

6. Contaminants and pollutants

Books and articles

Air Contaminants

ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers). Chapter 12 in *Heating, Ventilating, and Air-Conditioning: Fundamentals*. ASHRAE Handbook. Atlanta: 2001.

Airborne pollutants in museums, galleries, and archives: risk assessment, control strategies, and preservation management (also in French)

Tétreault, Jean , Ottawa: Canadian Conservation Institute = Institut canadien de conservation, 2003 ; 174 p. : ills., figs., tables ; 28 cm. , ISBN 0-662-34059-0

This book attempts to define the key airborne pollutants for indoor museums environments and provide some basic tools to assess the risk to collections exposed to these pollutants. It also establishes guidelines for control strategies that give flexible, pragmatic solutions and provides a simple tool for cost-benefit analysis that can fulfill
the principles and policy of individual museums.

Coatings for display and storage in museums (also in French)

Tétreault, Jean , In: *CCI Technical Bulletin*, N. 21, 1999, p. 1-46, fig., tables, ISSN 0706-4152

Coatings are used in museums, archives, and galleries for new construction, storage facilities, or exhibitions; but coatings have the potential to cause damage (such as corrosion and discoloration) to objects either by direct contact or the emission of volatile compounds. Most problems caused by contact can be solved by using interleaves, and problems related to volatile emission can be controlled by selecting appropriate coatings and allowing adequate drying periods. Coatings formed by oxidative polymerization (such as oil-based or alkyd coatings) emit harmful volatile compounds and should be avoided in conservation contexts. Other types of coatings are usually acceptable provided sufficient drying time is allowed: 4 days is usually enough in a ventilated room, but up to 4 weeks may be required in airtight enclosures such as well-sealed display cases and cabinets. The general recommendations in this document are based on the nature and use of the coatings rather than their trade names, as formulations may change. Information on the nature of coatings can be obtained from technical data or material safety data sheets, or tests can be run to determine the properties of a coating. The use of appropriate procedures and mitigation strategies will minimize any risk of damage.

Control of Gaseous Indoor Air Contaminants

ASHRAE., Chapter 44 in *Heating, Ventilating, and Air-Conditioning: Applications*. ASHRAE Handbook. Atlanta: 1999.

Display materials: the good, the bad and the ugly

Tétreault, Jean, In: *Exhibitions and conservation: pre-prints of the SSCR conference held in Edinburgh 21 & 22 April 1994* / Sage, Jo (ed.); Scottish Society for Conservation & Restoration. Edinburgh, United Kingdom, 1994, p. 79-87. ISBN 0950 8068 70

The aim of this paper is to establish an approach for the use of display materials by minimizing the risk of damaging artefacts. This preventive approach is based on the understanding of the nature of artefacts and materials and their possible interactions in the same environment. Appropriate selection of materials and adequate control of their noxious compounds are the keys to reaching compatibility between display materials and artefacts during an exhibition.

Gaseous pollution in the museum environment: the uses and abuses of monitoring campaigns

Blades, Nigel , In: *The conservator*, N. 22, 1998, p. 44-48, ISSN 0140-0096

Pollution studies in museums have been greatly advanced in recent years by the development of diffusion tube techniques for a range of important gases. This article discusses the advantages of diffusion tubes, and how they might be used successfully in the museum environment. Limitations of pollution monitoring such as the incomplete state of present knowledge, and the difficulties in interpretation that this causes, are also explored.

Guidelines on pollution control in museum buildings

Blades, Nigel; Oreszczyn, Tadj; Bordass, Bill; Cassar, May, In: *Museum practice , Supplement N. 15*, 2000, p. 1-27,

Internal pollutants, risk assessment and conservation priorities

Waller, Robert , In: *Triennial meeting (12th), Lyon, 29 August-3 September 1999: preprints. Vol. 1* / ICOM. Committee for conservation. London: James & James, 1999, p. 113-118. ISBN 1-873936-92-3

The application of a risk assessment framework, using the parameters Fraction Susceptible, Loss in Value, Probability and Extent, to interpret the significance of internal pollutant concentration distribution in a systematic mineral collection, is demonstrated. This interpretation facilitates the application of conservation research findings to setting collection care priorities and strategically identifies the highest priorities for further conservation research.

Pollutants in the museum environment: practical strategies for problem solving, exhibition and storage

Hatchfield, Pamela B. , London: Archetype Publications, 2002 ; XI, 203 p. : ills., tables ; 27,5 cm. , ISBN 1-873132-96-4 .

The pollution problem in perspective

Bradley, Susan; Thickett, David , In: T*riennial meeting (12th), Lyon, 29 August-3 September 1999: preprints. Vol. 1*/ ICOM. Committee for conservation . London: James & James, 1999, p. 8-13. ISBN 1-873936-92-3

The effect of the indoor pollutant gases reduced sulphides and organic acids and aldehydes on artefacts in the British Museum collections has been the subject of a long-term study. An evaluation of the data from the study, and experimental work, has shown that alteration by sulphide pollutants is most difficult to prevent; that carbonyl pollutants can be present but not cause alteration of objects; and that five factors influence the alteration of objects. These are the composition and conservation history of the object, the concentration of pollutant gas, the relative humidity and the temperature.

Websites

Indoor Air Quality in museums and archives

www.iaq.dk

Papers and abstracts of all the conferences

PreservArt database, CCQ

http://preservart.ccq.mcc.gouv.qc.ca

Tétreault CCI links to pollutant info

www.cci-icc.gc.ca/links/pollutants/index_e.shtml

7. UV and light

Books and articles

The continuing development of a practical lighting policy for works of art on paper and other object types at the Victoria and Albert Museum

Ashley-Smith, Jonathan; Derbyshire, Alan; Pretzel, Boris , In: *Triennial meeting (13th), Rio de Janeiro, 22-27 September 2002: preprints /* ICOM Committee for conservation. London: James & James, 2002, p. 3-8. ISBN 1-902916-30-1

Control of Damage to Museum Objects by Optical Radiation

Anon., Publication CIE 157:2004, ISBN 3 901 906 27 4

The report comprises three parts. The first part reviews the scientific principles that govern the processes of radiation-induced damage to museum objects with the aim of providing fundamental information for museum conservators and research workers. The second part reviews current knowledge and recent research to provide a commentary on the efforts of researchers to better understand how these processes may be retarded or eliminated in the museum environment. The final part gives the committee's recommendations for lighting in museums in the form of a practical procedure that covers setting up a new display and monitoring the lighting during the life of the display. This procedure takes account of the research findings that have been reviewed as well as recommendations published by other organizations, and is modeled on current practice in several of the world's leading museum institutions. The Report is written in English, with a short summary in French and German. It consists of 35 pages with 6 figures and 8 tables, and is readily available at the CIE National Committees or the CIE Central Bureau in Vienna.

The Lighting Decision

Michalski, S. , In: *Fabric of an exhibition: an interdisciplinary approach. Preprints of a conference..., Ottawa, Canada, September 22 to 25, 1997 = L' étoffe d'une exposition: une approche pluridisciplinaire. Prétirages de la conférence., Ottawa, Canada, 22 au 25 septembre 1997* / Canadian Conservation Institute = Institut canadien de conservation. Ottawa, Canada. ISBN 0-660-60261-X

Contains the rationale behind suggestions for adjustment of lux level for visibility, and for object sensitivity. Contains a table of light sensitivity ratings for historic textile dyes.

Lighting for museums and art galleries
CIBSE, 1994 ; The Chartered Institution of Building Services Engineers, London, 56 p.

Museum and art gallery lighting: a recommended practice
Illuminating Engineering Society of North America (IESNA). New York, United States ,1996; 91 p, (IESNA RP, 30-96) , ISBN 0-87995-132-X

8. Incorrect relative humidity and incorrect temperature
Books and articles

(ASHRAE Handbook chapter) Museums Libraries and Archives
Anon, Chapter 21 Museums Libraries and Archives, in *2003 ASHRAE Handbook. Heating, Ventilating, and Air- Conditioning APPLICATIONS, SI Edition*. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc: Atlanta.
This is the handbook used by all North American HVAC engineers, and referred to in many other countries. This chapter is the standard reference for RH, temperature, and pollutant specifications in museums. It is the only published environmental control specification for museums based on a risk assessment approach to various levels of control of RH and temperature fluctuation. Contains a useful summary of the various forms of incorrect RH.

Climate control priorities and solutions for collections in historic buildings
Michalski, Stefan , In: *Forum,* Vol. 12, N. 4, 1998, p. 8-14, ISSN 0893-9403

Guidelines for humidity and temperature for Canadian archives (also in French)
Michalski, Stefan , In: CCI Technical Bulletin # N. 23, 2000, Ottawa: Canadian Conservation Institute p. 20 ISSN 0706-4152
This bulleting discusses the temperature and humidity recommendations for archives, and explains how and why they have changed. It also provides practical strategies and straightforward advice to help you meet these new guidelines and protect your collections.

The endnotes provide an extensive review of the literature on ageing rates of paper, tape, photographic materials, and dependence on climate conditions. Several graphs and tables for estimating effect of temperature and humidity on lifetimes.

Let's be honest: realistic environmental parameters for loaned objects
Ashley-Smith, Jonathan; Umney, Nick; Ford, David , In: *Preventive conservation practice, theory and research: preprints of the contributions to the Ottawa congress, 12-16 September 1994* / Roy, Ashok (ed.); Smith, Perry (ed.); IIC. London London: International Institute for Conservation of Historic and Artistic Works, 1994, p. 28-31.

Mould prevention and collection recovery: guidelines for heritage collections (also in French) Guild, Sherry; MacDonald, Maureen , In: *CCI Technical Bulletin*, N. 26, 2004, Ottawa: Canadian Conservation Institute p. 1-34, ills., figs., tables, ISSN 0706-4152
Mould infestation in heritage collections can damage artifacts and may pose a health risk to individuals who work with these collections. This Technical Bulletin presents information on mould morphology, prevention of mould growth, actions to take should mould occur and health effects relating to mould exposure. It informs the reader how to remove mould growth from artifacts and it describes the appropriate personal protective equipment to wear when working in a mould-contamined environment or when working with mould-infested artifacts.

One response to a collection-wide mold outbreak: how bad can it be - how good can it get?
Dicus, Diana Hobart , In: *Journal of the American Institute for Conservation*, Vol. 39, N. 1, 2000, p. 85-105, ISSN 0197-1360
In August 1995, the Detroit Historical Museum began a 19-month emergency response to a collection-wide mold outbreak in the artifact storage area of the Collection Resource Center at its Historic Fort Wayne site. The center houses an 18,000square foot storage area holding 51,000items from the Detroit Historical Museum's social and urban history collections. The $900,000 emergency response involved the museum's administrative, curatorial, and maintenance staff; 3 contract conservators; a temporary project staff of 17: and representatives of the Detroit Historical Society, the City of Detroit, and the Detroit Historical Museums' insurer. Management of the project included large-scale and long-term collection assessment, environment stabilization, documentation, procurement, training, health and safety, protection, and individual treatment of objects. The successful outcome of

the project depended upon decision making, project documentation systems, budgeting, personal organization, morale, productivity, and quality control.

Quantified risk reduction in the humidity dilemma

Michalski, Stefan , In: APT bulletin, vol. 27, N. 3, 1996, p. 25-29, fig.,tables, ISSN 0044-9466

Current knowledge implies that one can never accurately predict an optimum relative humidity for a historic structure housing artifacts. Sensible monitoring and a reasoned response will always be necessary.

Relative humidity re-examined

Erhardt, David; Mecklenburg, Marion F. , In: *Preventive conservation practice, theory and research: preprints of the contributions to the Ottawa congress, 12-16 September 1994* / Roy, Ashok (ed.); Smith, Perry (ed.); IIC. London London: International Institute for Conservation of Historic and Artistic Works, 1994, p. 32-38.

This paper presents results of materials research on museum objects conducted by the authors that leads them to the conclusion that many museum artifacts can safely withstand wider fluctuations in relative humidity than previously accepted by many conservators. The publication of this paper, and the claim by the authors that adoption of these more liberal relative humidity limits could save museums significant amounts of money, resulted in the re-examination and evaluation of RH standards that continues today. These more liberal RH guidelines are important for museums in historic buildings who plan to implement practical climate control concepts'' (sic. Kershner & Baker)

Relative humidity: a discussion of correct/incorrect values

Michalski, Stefan , In: *Triennial meeting (10th), Washington, DC, 22-27 August 1993: preprints* / Paris: ICOM, 1993, p. 624-629

Relative humidity specifications for museums became very stringent during the 1960s and 1970s, without detailed explanation. The Canadian Conservation Institute has reviewed the relevant data in order to answer common cost/benefit questions, not just stipulate "correct" RH. Mechanical, biological, and chemical deterioration all rise sharply beyond 75 per cent RH, and increase significantly for every increment to 100 per cent RH. Fracture in rigid, constrained organic artifacts, given a relaxed state at some middle RH, becomes probable in

one cycle only for a drop of minus 25 per cent to minus 50 per cent RH. Fatigue models imply that each reduction of fluctuations to one half of this critical value will reduce deterioration per cycle to 0.01 per cent-0.00001 per cent. Many flexible or sliding assemblies are immune since constraint is missing.

I.b. BIBLIOGRAPHY

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I.c. BIBLIOGRAPHY ON LINE

I was the initiator of the Museums Emergency Programme Bibliography which is now hosted at the Getty Website: http://gcibibs.getty.edu/asp/

Museums Emergency Programme

Scope Note
A. Emergency Type
B. Planning
C. Response and Recovery
D. Risk Analysis
E. Social Factors
F. Heritage Type
G. Training
H. Legal

II FORMS

II.a. Questionnaire on Preventive Conservation Services' Survey
II.b. GCI Conservation Assessment
II.c. ICCROM Preventive Conservation Indicators
II.d. Museum Needs Assessment
II.e. Questionnaire Museums Emergency Programme –MEP Survey
II.f. Questionnaire MEP-Teamwork for Integrated Emergency Management
II.g. Disaster Relief for Museums Reporting Form
II.h. ICCROM Manual of Collection Risk Management (Archive)
II.i. ICCROM Manual of Collection Risk Management (Earthquake)

II.a. QUESTIONNAIRE ON PREVENTIVE CONSERVATION SERVICES' SURVEY

I prepared this questionnaire when I was working for ICCROM in 1998 in the framework of its programme "European Strategy on Preventive Conservation".

PREVENTIVE CONSERVATION SURVEY OF EUROPEAN SERVICES QUESTIONNAIRE

INTRODUCTION

The objective of the *Preventive Conservation Survey of European Services* questionnaire is to monitor the state of the art and analyse the situation of services in support of preventive conservation in 32 European States by providing useful data, information and suggestions for the development of the European strategy on preventive conservation.

You are kindly invited to answer the questionnaire, which is sent to European institutions which, directly or indirectly, deal with the conservation of museums collections.

It consists of a presentation of the institution and a checklist of 16 questions with yes/no answers.

In this document, “Preventive Conservation” means an agreed plan of action to slow the rate of deterioration and reduce risks for museum collections. The focus is on the surrounding of the collections, thus actions could refer to building maintenance, control of staff practices, influencing public attitudes, climate control and legislation. Preventive Conservation must be conceived and implemented by a multidisciplinary team of museum staff at all levels of responsibility with support from external professionals, organisations and public.

PREVENTIVE CONSERVATION SURVEY OF EUROPEAN SERVICES QUESTIONNAIRE

PRESENTATION OF THE SERVICES

MINISTRY/UNIVERSITY/CONSERVATION CENTER/INSTITUTE/LABORATORIES

1.1. Name of the Institution _____

1.2. Department _____

1.3. Address _____

1.4. Country _____

1.5. Telephone _____

1.6. Fax _____

1.7. e-mail_____

1.8. Number of personnel working in your institution (please, circle one):

< 10 11 / 25 26 / 50 51 / 100 101/250 > 250

1.9. Budget of your institution (in Euro): _____

1.10. Name of the person designated as responsible for preventive conservation (if existing): _____

1.11. Position of a person designated as responsible for preventive conservation (if existing): _____

1.12. Name of the person who will answer to the questionnaire:
_____

1.13. Position of the person who will answer the questionnaire:
_____

PREVENTIVE CONSERVATION SURVEY OF EUROPEAN SERVICES QUESTIONNAIRE

QUESTIONS

	YES	NO
1. Is there in your institution a department, division, office, etc. which provides support to preventive conservation?	☐	☐
1.a. If you answer no, but you could at least identify a department or a person which could be responsible for preventive conservation, please write here the reference: …… ……		
2.Does your institution have a written statement of its purpose and its goals concerning preventive conservation?	☐	☐
3.Does your institution have a 3 to 5 year plan to promote preventive conservation?	☐	☐
4. Does the budget of your institution indicate a group of expenses for programmes in support of preventive conservation?	☐	☐
4.a. If yes, which percentage of the total budget is dedicated to preventive conservation? ……		

	YES	NO
5.Does your institution provide a training program about preventive conservation If yes, please indicate: 5.a. At which level (national, regional, …) 5.b Duration of training 5.c. To whom the program is addressed 5.d. Other useful information …… ……	☐	☐
6. Has your institution developed a methodology for implementing preventive conservation?	☐	☐
7. Has your institution defined preventive conservation standards?	☐	☐
8. Has your institution produced preventive conservation assessment systems?	☐	☐
9. Does your institution carry out research on preventive conservation:		
9.a. stability of materials,	☐	☐
9.b. packing guidelines,	☐	☐
9.c. environmental standards,	☐	☐
9.d. support techniques,	☐	☐
9.e. legal aspects,		
9.f. other (specify ……)?		
10. Does your institution organise activities to involve the public in caring for collections:		
10.a.. information panels,	☐	☐
10.b. publications,	☐	☐
10.c. demonstrations,	☐	☐
10.d. special events,	☐	☐
10.e. heritage open days,	☐	☐

10.f. advice to the public,

10.g. courses,

10.h.other (specify ……)?

	YES	NO
11. Does your institution provide preventive conservation advisory services:		
11.a. consulting,	☐	☐
11.b. loan of literature,	☐	☐
11.c. information on sources of supplies,	☐	☐
11.d. on-site advisory,	☐	☐
11.e. other (specify ……)?	☐	☐
12. Does your institution produce publications on preventive conservation:		
12.a. research,	☐	☐
12.b. handling guides,	☐	☐
12.c. standards,	☐	☐
12.d. newsletters,	☐	☐
12.e. other (specify ……)?	☐	☐
13. To your knowledge does your country have legislation which implies the responsibility of national museums in preventive conservation? If yes, when possible, please provide the legislation.	☐	☐
14. To your knowledge, is there in your country a statute, which defines the role and the responsibilities of the persons in museums that co-ordinate preventive conservation of museum collections? (Keep in mind, as a reference, the point 6.3 of the Code of Professional Ethics of ICOM-1986: *…In attempting to achieve this high ideal, special attention should be paid to the growing body of knowledge about preventative*	☐	☐

conservation methods and techniques, including the provision of suitable environmental protection against the known natural or artificial causes of deterioration of museum specimens and works of art…)

15. To your knowledge, are there in your country services which provide support to preventive conservation? ☐ ☐

If yes, please write here the references

……

……

	YES	NO
16. To your knowledge, in the National museums of your country is preventive conservation included in the job description of:		
16.a. conservator-restorers,	☐	☐
16.b. curators,	☐	☐
16.c. director,	☐	☐
16.d. educators,	☐	☐
16.e. guardians,	☐	☐
16.f. registrar,	☐	☐
16.g. collection manager,	☐	☐
16.h. maintenance staff,	☐	☐
16.i. technicians,	☐	☐
16.l. other (specify ……)?	☐	☐

COMMENTS

II.B. ICCROM PREVENTIVE CONSERVATION INDICATORS

I developped this self assessment form “Preventive Conservation Indicators” for ICCROM in 1998 in the framework of its project “European Preventive Conservation Strategy”.

II.b. GCI CONSERVATION ASSESSMENT

THE CONSERVATION ASSESSMENT:
A PROPOSED MODEL FOR EVALUATING MUSEUM ENVIRONMENTAL MANAGEMENT NEEDS
GETTY CONSERVATION INSTITUTE – 1998

INSTITUTIONAL BACKGROUND

Note: This information sheet should be submitted by the museum to the assessors prior to the assessment visit. This information sheet should accompany the information listed under *Preparing for a conservation assessment.*

Name of institution/ museum: Address:
Phone:
Fax:
E-mail address:
Contact person:

Type of institution: Museum
Historic house
Library/ Archive
Historic/ archaeological site
Other

Date of establishment of institution:

Governance (i.e., owner of institution and collections):
- Non-governmental non-profit organization: public/ private
- National government
- State/ county/ provincial government
- Municipal government
- University
- Religious organization
- Other

If governmental, please indicate the office/ ministry/ agency responsible for the institution:

Institution's mission or purpose:

Does the institutional mission include collection conservation?

Does the institution have any special concerns with respect to the assessment and its outcome?
Name of museum director
Names, titles of museum staff who will participate in/ contribute to the assessment

THE MACRO- ENVIRONMENT OF THE MUSEUM

CLIMATE CHARACTERIZATIONS
Climate is perhaps the largest, and least controllable, influence on the museum. Climate patterns and changes may also provide opportunities to improve the interio environment. In any event, the typical climate patterns should be well understood.

Temperature
High average temperature limits opportunities for cooling. High temperature implies potential for visitor physiological stress. Small annual drift and small diurnal change limit opportunities for seasonal or daily cooling cycles.
What is the mean annual temperature? What is the T of monthly temperature averages? What is the T diurnal? What is the T maximum?

Relative humidity
High relative humidity limits opportunities for drying and increases chances of mold growth, insect attack and corrosion of metals.
What is the typical relative humidity level? What is the typical relative humidity range?
How does relative humidity vary? Daily? Seasonally?

Precipitation
Patterns of precipitation are important to understanding relative humidity levels and for developing strategies in source moisture control.
What is the precipitation frequency? Annual (mean / maximum)? Weekly? Daily? What is the intensity of precipitation? Light shower of moderate duration? Intense cloudburst?
Is precipitation accompanied by winds? Does wind-driven rain enter wall openings?

Wind and air movement
Patterns of wind and air movement are important to strategies for natural ventilation and cooling.
Describe wind pattern. Sea breeze? Trade wind?
Cool? Hot? Fog? When do winds normally occur? Morning? Afternoon? Evening? Night?

Solar radiation
Patterns of solar radiation and cloud cover affect the intensity of natural light in the interior as well as heat gain and loss and temperature.
Describe sky (cloud) cover patterns. Clear sky? Broken clouds? Overcast? Mid-day? Afternoon? Night?

Air Quality
Air quality is a critical consideration if implementing ventilation strategies, especially where mechanical filtration is not practical.

Particulates:
What is the source of particulates? Urban particulates - traffic dust, smoke, soot? Agriculture dust and smoke?
Does intensity vary by time of day or year? Are particulates reactive?

Gaseous Pollutants:
What is the source? Industrial and vehicular exhaust gases? Does intensity vary by time of day or year?

Air-borne insects (all stages of development):
Describe species, frequency, intensity. Seasonal variations.

Vegetation & landscaping near building
Vegetation & landscaping have important beneficial and adverse implications with respect to interior environment and collections risk. Vegetation & landscaping may facilitate natural filtration of pollutants, provide shading of solar radiation, affect ventilation and wind speeds, retard drying and removal of moisture, elevate local moisture levels, and may facilitate insects and microorganisms if allowed to decay. Landscape maintenance may introduce moisture from irrigation or pollutants and debris from cutting and gasoline powered equipment.

Vegetation & landscaping:
Describe the landscape and vegetation. High canopy, open understory? Dense, building height foliage, close to walls? Grasses? Describe plant species. Do plants produce fruit, nuts or flowers, vegetative litter & debris? Are they attractive to insects? Do plants and plant litter facilitate propagation of microorganisms, mold, mildew?

Surrounding Construction
The context of the museum building may significantly affect the interior environment of the museum. Buildings and pavements may impede ventilation, increase rain runoff or retard surface water removal, reflect light toward the building, retain heat, or elevate local temperatures. Parking lots or adjacent buildings with certain uses may increase local vehicular traffic and hence the amount of vibration and of pollution, especially from idling engines.

Adjacent buildings:
Describe proximity and nature. Distance? Height? Dark colored? Reflective glass? Describe use and occupancy. Intensity? Benign or hazardous? Vehicular or pedestrian dependent? Describe influence on the museum and its environment.

Pavements:
Describe proximity, extent and type. Pervious or impervious? Well drained away from building? Describe parking lots near building and proximity to ventilation openings. Do busses use parking lot? Are busses and taxis permitted to idle engines while waiting for tours or fares? Describe influence on the museum and its environment of parking areas and neighboring roads. Indicate type of traffic and volume.

Water sources:
Describe proximity, extent and type. Are there fountains? Ornamental ponds? Detention ponds? Sprays or irrigation systems? Drainage system? Sewage system?

Historic context:
Is the museum located in a historic center, rural setting or a protected area? If yes, describe the main planning or governmental restrictions for this area and especially for the museum building. Identify landmarks, surrounding main routes and conservation priorities for this context.

THE MUSEUM BUILDING: Characterizations

Thermal Performance and Response

The thermal performance and response of the building greatly influence the interior temperature, and thus both collections conservation and physiological comfort of museum staff and visitors. The thermal performance of the building may lead to strategies for interior temperature management, such as night-time cooling by re- radiation.

Temperature response:

Do the interior air and building surface temperatures closely follow changes in exterior air temperature, or is there a substantial time delay (such as 6 to 12 hours) between interior and exterior temperature peaks? Is the peak interior air temperature significantly higher or lower than the peak exterior air temperature, or are the two peaks approximately the same? What is the range of interior temperatures?

Thermal characteristics of construction:

Is the building wall construction massive, such as thick masonry walls, or lightweight, such as wood framing and wood cladding? Indicate materials used in the construction. Is the building roof construction massive, such as clay tile, or lightweight, such as wood framing and metal sheet? Indicate the materials used in the roofing. Are exterior walls shaded from solar radiation by vegetation? Trees? Overhanging eaves or porches? Are exterior walls light or dark colored? What materials are used in the surface treatment? Is the roof shaded from solar radiation by trees? Is the roof light or dark colored? Is the underside of the roof construction exposed to an occupied interior space or separated by an under-roof cavity formed by a separate ceiling construction? Is the under-roof cavity ventilated/ insulated? Are most of the walls exterior walls? How much glass is used on exterior walls or in roofs? What are the dimensions of windows? What is the height / volumes of interior spaces?

Moisture

Although exterior ambient relative humidity may be characteristically high, moisture management at the level of the building is an important strategy for managing interior relative humidity levels.

Exterior source moisture control - roofs:

Does the roof leak? Is it well maintained? Is it easily accessible for maintenance? Is the roof constructed of, or clad with, materials that are pervious to moisture? Are roof coatings and membranes well maintained? Is the roof well drained? Does ponding occur? Are roof penetrations or appurtenances such as bell towers or chimneys rain-tight? Do roof cladding or membrane coverings remain secure and water-tight in wind-driven rain? Is roof rainwater collected and conducted away from the building by gutters and downspouts? Are the gutters and downspouts of adequate size for the intensity of rainfall and the size of the roof? Do the gutters and downspouts leak? Are gutters and downspouts maintained clear of vegetative litter and other blockages? Have all potential paths of exterior water entry been accounted for?

Exterior source moisture control -walls:

Are there open cracks, fissures or other opportunities for moisture penetration through the walls? Are the wall constructed of materials that are pervious to moisture? Are wall coatings, paints, and renderings well maintained? If roof rainwater is not collected by gutters, are the exterior walls protected by roof overhangs? Are wall openings protected from wind-driven rain entry by closures such as windows, doors or shutters or by overhangs? Is collected or uncollected rainwater drained away from the building at grade, or is there surface ponding of water near the walls? Are there indications of rising damp in the walls? Water entry through subgrade walls? Have all potential paths of exterior water entry been accounted for? Are wall opening closures remain secure and water-tight against wind-driven rain?

Interior source moisture control -occupancy:

Are there sources of interior moisture such as active water wells or cisterns? How is the floor made? Are there bare earth floors or under-floor cavities? Interior fountains or basins? Are there functional spaces for activities that release water or water vapor to the interior, such as kitchens and restrooms? Are the rooms serving these activities equipped with windows and/or exhaust fans vented to the exterior? Are there housekeeping activities, such as wet-mopping floors, which may release moisture to the interior? Are there leaks in interior systems and piping which may release moisture to the interior? Have all potential sources of interior moisture been accounted for?

Symptomatic evidence of moisture problems:

Is there evidence of paint or rendering failure on building surfaces? Are there rust stains or signs of corrosion? Is exterior wood decayed? Are there accumulations of mold or mildew on building surfaces? Is there evidence of

splashing on the walls or ponding at grade?

Ventilation and Filtration
Ventilation is an important consideration in reducing moisture and growth of microorganisms, especially where climate control systems are impractical. Efficient ventilation is often an attribute of older buildings, although alterations may have diminished this capability.

Cross-ventilation:
Is there cross-ventilation? Does the arrangement and shape of rooms, the distribution of wall openings and size of the openings allow effective cross-ventilation? Is cross-ventilation impeded by exhibition cases or other fixtures? Is cross-ventilation impeded by closed doors between rooms?

Stack-ventilation (vertical):
Does arrangement and shape of floors and vertical features such as stair halls, atria and closed courtyards allow effective stack-ventilation?

Is stack ventilation impeded by alterations?

Ventilation control (cross and stack):
How is ventilation controlled? Shutters? Windows? Doors? Operable skylights?

How are ventilation controls, such as shutters, operated? Are the opening and closing of these devices regulated by procedure?

Mechanical ventilation:
Are fans used to supplement natural ventilation? If so, where are they deployed?

Air filtration:
Are wall openings protected by insect screens? Draperies?

Natural Light
The incidence and intensity of natural light entering a room may affect room temperature. Natural light can have an adverse effect on collections.

Light entry through wall openings:

How are wall openings configured to reduce light entry? Awnings or overhangs? Recessed openings in thick walls? Shutters? Louvers?

How are natural light controls, such as shutters, operated? Are the opening and closing of these devices regulated by procedure? Are there skylights?
What is the size of the windows? What is their location and distribution in the building?

Are windows glazed? Are they protected from direct insolation? Are UV/IR filters used on glazed windows? How often are these checked/ replaced?

What is the effective day lighting permeability of windows, sky lights and other openings (day lighting access areas / room surface).

Structure
The building construction and arrangement, and their response to the extraordinary loads of excess occupancy, winds and seismic activity may increase or decrease risk to the collections.

Structural capacity for occupancy:
Is floor load capacity adequate for the maximum number of visitors? Special events? Balconies?

Is floor load capacity adequate for concentrations of collections storage? Special exhibits or large objects?

Structural resistance to winds:
Does the main structure, including roof framing, adequately resist wind loads?
Do appurtenances and projections, such as chimneys, towers, awnings, canopies, and balconies adequately resist wind loads?

Do roof cladding or membrane coverings remain secure and water-tight against high winds?

Are wall opening closures remain secure and water-tight against high winds?

Structural response to seismic activity:
Is the building structure earthquake resistant?

What portions of the building are vulnerable to collapse or severe dislocation in a seismic event?

Are appurtenances and projections, such as chimneys, towers, awnings, canopies, and balconies, braced for ground motions?

Protection against insects, rodents, birds, animals
Describe the pest detection and control program (are traps used for monitoring the presence of insects, what areas of the building are monitored, who has responsibility for the monitoring program, is a log or register maintained of pest problems, does the institution have a history of a particular type of pest problem.

Fire Resistance and Protection
The building construction and configuration, as well as systems for detection and protection against fire, significantly affect the degree of fire risk to the collections. These consideration may influence strategies such as the selection of appropriate locations for collections storage areas or exhibition areas.

Structural resistance to fire:
Are the structural materials non-combustible? Combustible and exposed? Combustible with fire-resistive finishes?

Interior resistance to spread of fire:
Are interior wall finishes combustible or non-combustible? Are interior floor finishes combustible or non-combustible?
Are interior ceiling finishes combustible or non-combustible?

Can fire travel horizontally between rooms without interruption? Can fire travel vertically between floors without interruption?
Interior resistance to spread of smoke:
Can smoke communicate horizontally between rooms without interruption?

Can smoke communicate vertically between floors without interruption?
Fire detection and alarm:
Describe the fire detection and alarm system. Smoke or heat detectors with automatic alarm and notification? Manual stations with subsequent alarm and automatic notification? Evaluate the effectiveness of each type of fire/smoke detector and deployment.

Fire protection:
Describe the type of fire protection system. Automatic sprinkler system? Manual hose stations at critical locations? Hand-held portable fire extinguishers?

Are these appropriate to the size and type of fire that may be likely? How is the system checked and maintained?
Can fire brigades quickly access critical areas of the building to extinguish a fire? How

is such emergency access controlled? Does the building configuration impede access after security measures are removed?

Physical Security

The building construction and configuration, as well as systems for detection of security breaches, significantly affect the degree of theft and vandalism risk to the collections, and may influence strategies as the appropriate location in the building for collections storage areas or exhibition areas.

Structural resistance to exterior entry:
Is the wall construction sufficient to resist forced entry? Roof construction? Floor and subgrade construction?

Resistance of wall and roof opening closures to exterior entry:
Are closures in the walls, such as shutters, windows and doors, adequate to resist forced entry? Are roof closures, such as hatches, scuttles and skylights, adequate to protect against forced entry?

Are exterior doors guarded or controlled?

Interior resistance to entry of sensitive areas:
Are interior partitions and doors surrounding collections exhibit and storage areas adequate to resist forced entry?

Interior layout of public spaces and ease of observation:
Does the arrangement of public corridors and exhibition spaces permit visual supervision of visitors by museum docents and guards? Are there "blind spots" created by remote rooms or temporary exhibition panels?

Lock hardware:
Are door and window locks and hardware adequate to deter entry?
Deterrence measures:
Is there low contrast exterior lighting to deter unauthorized exterior access?

Is interior lighting maintained at low levels to permit monitoring?

Security detection systems:
Describe the security detection and alarm system. Opening control? Opening and movement monitoring? Silent or audible alarms? Automatic notification? Video monitors? Glass break detection? Evaluate the effectiveness of each type of security detector and deployment.

THE COLLECTION ENVIRONMENT

1. COLLECTION USE AND MANAGEMENT

Type of collection

What kinds of collections does the institution own?
- Archaeology
- Electronic media
- Ethnography
- Fine and decorative arts
- Graphic art
- History
- Geology/ mineralogy/ paleontology
- Industrial machinery
- Library/ archival material
- Military
- Musical instruments
- Natural history
- Science/ technology
- Sound recordings

Use of collections

How is the collection used?
- Exhibitions (indicate whether in-house and/or traveling exhibitions)
- Scholarly research
- Public education / outreach

Are collection materials used in hands-on, educational activities?
If yes, what percentage? How often?

Collection care policies

Is there someone responsible for caring for the collections in the institution? Does the person's job description reflect these activities?
Is there a conservator on staff?

Who is allowed to handle the collection?

Does the institution obtain conservation services for the collection through an external provider?
Has the institution ever engaged a conservator to assess all or part of the collections? If yes, elaborate (include date of assessment)

Where does the responsibility for each of the following activities lie (i.e., title of staff member, outside provider, etc.)?

- Maintenance of the collections in storage
- Labeling/ marking of collection materials
- Cleaning, conserving/ restoring collection materials
- Preparing collection materials for exhibit or loan
- Packing and unpacking of collection materials

Is formal orientation or training provided for staff in the following areas:
- Collection conservation procedures

- Handling, exhibiting, storing collection objects
- Labeling/ marking objects
- Packing/ unpacking techniques
- General housekeeping and cleaning

Describe the policies and procedures (written or observed) for handling, management and/or use of the collections. Are there any procedures that place the collection at risk?

Who (1) develops, (2) implements, and (3) has authority to modify this policy?

Does the institution have a long-range conservation plan for the collection. (This plan should be evaluated in light of the findings of the assessment.)

Who (1) develops, (2) approves, and (3) implements long-range plans for collection care: (1)
(2) (3)

Are funds regularly budgeted for the conservation of the collections? Has this amount changed over the past five years? Is the amount allocated adequate to meet the needs of
the collection/ (Describe how the mission of the institution and/ or its operations should support each other to reflect collections conservation concerns.)

Describe the institution's condition reporting procedures. How is the condition of the collections assessed. Is photographic documentation a part of condition reporting?

Are there any procedures that are unique to the institution's types of collections (i.e., preparation, dissection, sampling).

Does the institution permit objects to leave the premises?

Reason objects may leave the institution:
- Examination/ analysis
- Exhibition
- Research
- Other

Does the institution use a contract or written guidelines that specifies the terms under which objects from the collection may leave the institution? (Include samples of these documents, if available.)

Who in the institution reviews the condition of an object, and approves its leaving the institution?

What are the criteria for allowing an object to leave the institution?

Does someone in the institution perform condition reports before and after an object from the collection leaves the premises?

Does the institution borrow objects from other collections? What is the purpose of borrowing?
- Examination/ analysis
- Exhibition
- Research
- Other

Does the institution adhere to specific guidelines or contractual arrangements when borrowing from other institutions?

Does the institution perform condition reports when borrowed objects are received and returned to their owners?

Exhibition Policies and Systems

What percentage of the collection is on exhibition?

Are there permanent exhibitions? Approximate percentage of objects on permanent exhibition?

Are there temporary exhibitions? Approximate percentage of objects on temporary exhibition?

How often do the temporary exhibitions change?

What percentage of objects on display in exhibitions are borrowed from other institutions?
Who has responsibility for the following activities?
- Choosing objects for exhibitions
- Designing exhibitions
- Installing exhibitions
- Monitoring the condition of collections on exhibit
- Monitoring the environmental condition of collections on exhibit

Are collection materials displayed in areas other than the exhibition galleries (i.e., offices, corridors, outdoor areas, etc.). If yes, where?

Describe the manner in which objects are exhibited:
- enclosed exhibition cases
- frames
- open display

Are there adequate physical barriers for objects on open display?

For what purposes are the exhibit cases accessed by staff? How often are they accessed?

What materials are used to construct exhibition cases? Are these materials tested for possible off-gassing of harmful materials prior to use?

Are the exhibition cases air-tight? If ventilation holes or spaces exist, is screening and/or filtering material used over the gaps to prevent the entry of dust and insects?

Are micro-climates used to control the RH within cases? If so, who constructs and maintains them? How often are the micro-climates monitored and maintained?

Have there been any noticeable problems with them?

Are objects on display monitored for changes of condition?

Are objects on exhibition safely supported and secured? Are proper mounting and support materials and systems used?

How are the galleries spaces (floors, surfaces of cases, other furniture) cleaned? How often?

Are any cleaning materials used in proximity to the exhibited objects that may prove harmful to them?

Has any previous damage been observed from cleaning materials/ practices in gallery areas?

Storage Policies and Systems

Is all of the collection storage located in the same building?
If not, in which buildings is storage located?

How is storage of the collection organized?
- By culture

- By material
- By object type
- By size
- Other:

Is there short-term temporary storage or preparation areas? Under what circumstances are objects brought into these areas?

Where are the storage areas located with respect to other museum functions?

Does the museum have a special storage area for very sensitive or valuable objects?

If not, are any special provisions made for these materials?

Are storage areas used for activities other than collection storage? Can these activities pose a risk to the collection?

How many doors open onto the storage area? Area all of these doors in regular use? Are doors secured and alarmed to protect against unauthorized entry? Are doors gasketed to protect against environmental changes and the entry of pests?

Are storage areas easy to clean and inspect? Can staff clean on top of and under cabinetry?

Is there enough space to allow easy movement of staff, objects, and equipment through storage areas?

Do water, steam, drain, fuel, or sewer pipes run through or immediately adjacent to storage areas?

Is there equipment or building services requiring monitoring and servicing by museum personnel?

Are the storage areas located below grade? Does water drain away from the building, or do storage areas flood in heavy rains?

Are objects, and furniture equipment located at least four inches off the ground to protect from possible flooding?

Are collections stored in places other than designated and secure storage areas? (Attics, offices?) Are storage areas over-crowded?

Are collection objects placed on the floor or in the aisles between cabinets?

Does the institution need additional space for storage? Is there appropriate space within the institution that can be used for this purpose?

Is space in the existing storage area used well? Should it be reconfigured for better security of the collection/ or better use of space?

Describe the type of storage furniture / systems. Are they appropriate to the materials being stored?

Describe the general condition of storage furniture and equipment.

Are materials which may potentially harm collection objects used in the storage area

Is metal cabinetry free from rust or other corrosion?

Is cabinetry free from splinters, nails, and bolts which may damage objects?

Do cabinets close securely to exclude pests and dust? Are there gaskets? Are cabinets locked?

Are there non-collection objects housed in storage areas that may potentially harm the collection?

Are objects well-supported, padded

Have all objects been assigned locations within storage?

Are the locations of objects clearly indicated on storage furniture

Are objects in drawers, cupboards or shelves readily accessible, or must some objects be moved to obtain access to others?

Are vulnerable objects buffered against contact with acidic materials (woods, papers, boards) when stored in proximity to them?

Who has access to storage areas? Are access logs maintained?
Are persons who are not members of staff (i.e., visiting scholars) permitted to work in storage areas unaccompanied?

Does the institution have written policies or guidelines covering:
- handling of collections in storage?
- activities permitted in storage?
- moving objects into or out of storage
- other policies or guidelines?

(If possible, the collection assessor should examine copies of written policies or guidelines)

Describe the procedures for moving objects into and out of storage. Are collection re-locations documented?
Are storage areas routinely monitored for
- building problems?
- evidence of pests and other biodeterioration?
- inappropriate levels of RH?
- condition of collection materials?

Does the institution have policies and procedures for *preventing damage* to the collections in storage as a result of an emergency?

Does the institution have a written plan for *responding* to an emergency affecting the collections in storage?

Other institutional activities with implications for the collection

Photography & Video/Filming

Does the institution have a policy for photography or filming of the collections? Does the institution photograph the collections?
Are visitors allowed to photograph the collections?

If photography of collections is permitted, what type of lighting is allowed (flash, floodlight illuminated, etc.)?

Are special precautions taken to prevent damage due to photography or filming?

2. SENSITIVITIES OF THE COLLECTION TO CLIMATIC CAUSES OF DETERIORATION

Indicate the **predominant materials** represented in the collection.

Inorganic

- Ceramics, pottery
- Clay, unbaked
- Fossils
- Glass
- Metal
- Minerals
- Plaster
- Stone

Organic

- Amber
- Antler, bone, ivory
- Barkcloth, objects
- Basketry
- Botanical materials (dried seeds, grasses)
- Carbonized materials
- Feathers
- Lacquer
- Leather, hide and skin
- Mummified remains
- Paper, papyrus Oriental papers pastels, charcoals stamps
- Photographic materials Cellulose nitrate Diacetate films
- Shell
- Textiles
- Wood

Collection objects of composite materials

- Books
- Contemporary art
- Ethnographic artifacts
- Costume and costume accessories
- Furniture
- Mosaics
- Musical instruments
- Paintings
- Polychrome sculpture
- Scientific, technical instruments
- Wall paintings
- Other (specify)

Summarize the general condition of the collection.

Are there any collection condition problems presently observable?

Describe the type of problem, collection material affected, and location within the building.

Is the deterioration recent or historic damage? Is the

deterioration active or inactive?
Is there any indication of the cause of the deterioration?

WHAT ARE THE CHIEF RISK FACTORS (BOTH PRESENT AND POTENTIAL) FOR THE COLLECTION?

Relative humidity/ temperature

Inappropriate RH is that which is either a) excessively high or low; b) involves changes or cycles of change in temperature and/or relative humidity.

Which materials in the collection are at particular risk from inappropriate levels of RH and/ or temperature?

Identify collection areas within the museum that may be prone to inappropriate levels/ changes in temperature and RH. Do these areas contain sensitive materials?

Is the institution trying to maintain particular levels of RH and temperature in collection areas? What are these target levels?

Are these levels of temperature and relative humidity achievable year round with present climate control strategies? What are the chief obstacles to achieving these levels?

Does the attempt to achieve or maintain these levels pose a risk to the collection due to the possibility of fluctuations?

Radiation

Which materials in the collection are at particular risk from inappropriate levels of visible/ invisible light?

Have the staff noticed fading of collection materials on display, or fading of wall finishes, fabrics on or near windows or in display cases?

Does the institution have lighting policies which are based on the sensitivity of the various collection materials?

Describe the use of natural light in galleries, exhibition spaces, and storage areas and the types of objects illuminated.

Describe the type(s) of artificial ambient lighting used in galleries, exhibition spaces, and storage areas (electric -- i.e., fluorescent, incandescent, tungsten halogen, fiber optics, neon, etc. -- and non-electric-- i.e., candles, kerosene lamps, etc.)

Describe the type(s) of artificial exhibition lighting used for object/exhibition case illumination. Are lamps/ballast's placed inside of exhibition cases? If so, are measures taken to reduce the build-up of heat within the cases?

Describe any types of filtration used to reduce light intensity (i.e., UV shields on fluorescent tubes, intensity controls, etc.).

Are exhibits designed to limit exposure of light sensitive materials?

If a policy to limit light exposure exists, are the recommended light levels/ periods of exposure regularly followed? If not, what are the chief obstacles to following these recommendations?

Describe any curtains, blinds, shutters, awnings, or other light reduction materials (i.e., light reduction coatings, film, sheet goods, etc.) used to reduce the intensity of the light entering the

building through windows or skylights.

If blinds and curtains are used, how are they controlled to ensure that the objects are protected from high intensity natural light?

Have wall surfaces that reflect natural light been treated to absorb ultraviolet radiation?

Contaminants

Which materials in the collection are at particular risk from gaseous contaminants from either indoor or outdoor sources?

Is there any present evidence of damage by gaseous contamination. Describe. Are there potential sources of additional gaseous contamination?
Describe any sources of or activities producing hazardous gasses within or around the museum which might be dangerous to the collections (i.e., use of certain wood products in storage/ exhibition furniture, paints, custodial cleaners, etc.)

Which materials in the collection are at particular risk from particulate contaminants from either indoor or outdoor sources?

Is there any present evidence of damage by particulate contaminants. Describe.

Are there potential sources of additional particulate contaminants?

Describe any activities generating particulates in or around the museum which might prove a risk for the collection (construction activity, smoking, fuel burning, auto exhaust, agricultural or industrial activity, etc)

Is the collection routinely monitored for gaseous/ particulate pollution? If so, by what means and how often?

Does the museum have at the present time a strategy for dealing with gaseous and/or particulate pollutants (i.e., filtration system, no smoking policy, construction precautions, entry vestibules, sealed cases, dust covers, etc.).
How effective is this strategy?

Biodeterioration: Insects, rodents, birds, animals

Which materials in the collection are at particular risk from attack by insects and other pests?

In which areas of the museum are these collection materials concentrated?

Has there been a history of damage by insects and other pests in collection areas? Which collection materials and areas have been most affected?
Is there evidence of the presence of insects and other pests (frass, droppings, nests) in or near collection areas?

Does the institution have a regular monitoring program for pest management and control within the collections? If yes, who has the responsibility for this program (staff or contractor)?

Describe the pest detection and control program (are traps used for monitoring the presence of insects, what areas of the building are monitored, who has responsibility for the monitoring program, is a log or register maintained of pest problems, does the institution have a history of a particular type of pest problem. If so, please describe)

Describe measures for preventing the entry of pests into collection areas: Are there screens on windows?
Are flowers (fresh or dried), plants, or firewood allowed in the structure?

Is food stored, prepared, or consumed in the building? Are special areas set aside for the storage, preparation, and consumption of food?

Are special precautions taken for disposal of food wastes or food storage?
What custodial measures are taken to keep all food preparation and consumption areas clean and pest-free?

Are pesticides used routinely on the structure, around the exterior of the structure or in interior spaces? What is the schedules for application?

If pesticides are used, in what formulations, and on what materials? Indicate any other measures undertaken to prevent or eradicate pests.
Are incoming collection objects or objects borrowed from other institutions isolated/ examined before entry into collection areas?

Are incoming non-collection materials (paper or wood products, food, etc.) isolated/ examined before entry into collection areas?

Are pesticides used routinely on the collections? What is the schedules for application?
If pesticides are used, in what formulations, and on what materials?

Indicate any other measures undertaken to prevent or eradicate pests (i.e., freezing, heating, modified atmospheres, etc.).

Biodeterioration: Micro-organisms: fungi, mold
Which materials in the collection are at particular risk from attack by molds and fungi?

In which areas of the museum are these collection materials concentrated?

Has there been a history of damage by micro-organisms in collection areas? Which collection materials and areas have been most affected?

What are the probable sources of damage by micro-organisms?

THREATS TO THE MUSEUM COLLECTION
AND BUILDING FROM NATURAL / MAN-MADE EMERGENCIES

INSTITUTIONAL PREPAREDNESS

Is the institution located in an area of known risk of natural disasters? To which type of disasters is the area prone?
Who in the institution is responsible for the security of visitors and staff?

Who in the institution is responsible for the safety of the collection and the building? Does the institution have a permanent security staff?
Does the institution use an outside contractor either instead of or to supplement permanent security staff?

Are security personnel on duty 24 hours? If not, what are the hours? Does the institution have an emergency preparedness plan?
What type of emergencies does the plan address?
- Civil emergency
- Natural emergency (fire, flood, earthquake, etc.)

Who in the institution has copies of the plan? Are there copies of the plan located at various points in the building and do the appropriate members of staff know the locations?

Is the plan current? How often is it reviewed and updated?

Does the institution have plans and procedures for **preventing damage** to the building and the collection?

Does the institution have a written plan for **responding** to an emergency affecting the building and collections?

Do all staff members know what to do in an emergency? Are there regular emergency preparedness drills?

What types of local/ national/ private services are available to the institution in case of an emergency?

Does the institution maintain supplies to cope with emergency situations. Are these supplies intended for 1) human needs, 2) building needs, and 3) collection needs? Where are the emergency supplies kept? Are they inventoried regularly?

For institutions in areas of potential natural disasters such as earthquakes or flooding, have special precautions been taken to minimize damage?

Do local emergency preparedness/ response coordinators (fire department, local government) have copies of the emergency preparedness plan? Have they been consulted in the development of the plan? Have they been informed of the special nature and features of the buildings and the collections?

THREAT CHARACTERIZATIONS

Fire

The irreversible and potentially catastrophic effects of fire on the museum, its collections, and possibly occupants, are well documented. The building structural response to fire is considered in the section The Museum Building: Characterizations

Ignition sources:
What are the potential internal ignition sources? Consider electrical systems, heating systems, cooking, visitors, special events or activities, arson and other factors.

What are the potential external ignition sources? Consider lightning, adjacent buildings and occupancies, vehicles and traffic, arson and other factors.

Fire brigades:
What is the proximity of fire brigades to institution? Are staffing and method of notification adequate to respond to museum needs?

What are typical notification times and response times for the off-site security services? Are response times consistent?

Describe available fire fighting apparatus, method of notification, water supply volume & reliability, and other factors.

Does the institution have systems for the detection and suppression of fire? Describe (i.e., sprinkler system, smoke detectors, fire extinguishers, etc.) How often is the system tested, and by whom?
Which spaces are protected by these systems?

Are the systems adequate for the needs of the building and the collection?

Does the institution have regularly scheduled inspections by the fire department?

Where is the water supply? Does the water come from a city water supply? Are there a sufficient number of fire hydrants near the institution?

Are there supplemental sources of water in case of a fire?

Are sprinkler heads and nozzles located so that they do not pose a threat to the collection?

Wind, Hurricanes, Typhoons
High winds from storms may interrupt the utility infrastructure to the building. High winds may also threaten building structural integrity and water-tightness; the building structural response to storms is considered under 4.5.

Warning systems:
What are the available methods for storm warnings?

What measures must be undertaken to secure the building in advance of the storm?

Utility infrastructure:
What are risks of interruption of primary utility infrastructure to the museum? What are the effects of interruption?
Recovery:
What are planned responses before or after storm to reduce collateral damage?

Lightning
Lightning can initiate structural fire and can interrupt critical systems.

Risk to structure:
Evaluate lightning risk to structure. Consider location and adjacencies, building height, construction, prior lightning frequency.

Risk to systems:
Evaluate lightning risk to systems. How are electrical, telecommunications, and alarm systems

isolated from potential lightning strikes.

Method of protection:
Is the building fitted with a lightning protection system?

Flooding
Flooding may cause structural failure from concentrated surface flows or may inundate building or collections, isolating the building from access. Wave surge may cause structural failure from wave impact. Flooding may interrupt critical systems.

Surface water:
What are risks from upstream or upland flooding due to storms?

Coastal flooding and waves:
What are risks of coastal flooding from tides, waves, storm surge?

Utility infrastructure:
What are risks of interruption of primary utility infrastructure to the museum?

What are the effects of interruption?

Recovery:
What are planned responses before or after flooding to reduce collateral damage?

Seismic
Seismic events may threaten collections in storage and on exhibit due to inadequate response by exhibition supports or collections storage shelving. Seismic events may interrupt the utility infrastructure to the building. Building structural response to seismic events is considered under the section "Building: Characterizations"

Collections storage:
Do collections storage methods provide adequate structural response to ground motion and prevent collapse of supports for collections objects?

Collections exhibition:
Do collections exhibition mounts and cases provide adequate structural response to ground motion and prevent collapse of supports for collections objects?

Utility infrastructure:
What are risks of interruption of primary utility infrastructure to the museum?

What are the effects of interruption?

Recovery:
What are planned responses before or after earthquake to reduce collateral damage?

Security
Note: for obvious reasons communication of security evaluations should be done with confidentiality. Report copies with security evaluations should not be widely circulated. The security provided by the building itself is considered above.

Police or security service:

What is the proximity of police and security services to institution? Are staffing and method of notification adequate to respond to museum needs?

What are typical notification times and response times for the off-site security services? Are response times consistent?

Access control:

Does the institution have a policy to secure against unlawful entry and theft?

Are there exterior and interior areas accessible to unauthorized persons? During operating hours? When closed?

How is access to exterior and interior areas by authorized persons controlled? Is access to collection areas restricted?

Are persons who are not members of staff (i.e., visiting scholars) permitted to work in collection storage areas unaccompanied?

Are access logs maintained?
How are special events, including service personnel, such as caterers, controlled?

Are objects in the collection registered and documented? Do photographs exist of most/ all of the collection?

Are locations of objects checked regularly? By whom?

Security systems:

Describe any systems or devices used to secure the building and its collections, i.e., window bars, security guards, alarms, surveillance cameras, movement detectors, etc.

II.c. ICCROM PREVENTIVE CONSERVATION INDICATORS

SELF ASSESSMENT FORM
PREVENTIVE CONERVATION INDICATORS

INTRODUCTION

The *Preventive Conservation Indicators* are a self-evaluation tool to assess the status of preventive conservation in museums. They are a checklist of 33 questions with yes/no answers.

The *Preventive Conservation Indicators* should be answered by a multidisciplinary team of museum staff members. Normally, a team of mixed museum staff will be able to answer the questions without help from outside specialists, although the questions could stimulate a lot of discussion and some searches for further information!

At the end of the document, there is a summary table, which will help the museum to visualise the situation of its preventive conservation programme and identify areas where improvements should be made. By completing the summary and setting priorities, the museum staff can define an action plan for preventive conservation. In this phase, the support of an external advisor might be necessary.

In this document, "Preventive Conservation" means an agreed plan of action to slow the rate of deterioration and reduce risks for museum collections. The focus is on the surrounding of the collections, thus actions could range from building maintenance, to control of staff practices, influencing public attitudes, climate control and legislation. Preventive Conservation must be conceived and implemented by a multidisciplinary team of museum staff at all levels of responsibility with support from external professionals, organisations and public.

The indicators are divided in seven topics:
Topic 1 Constitutional framework of the museum
Topic 2 Finance/Plans
Topic 3 Staff/Training
Topic 4 Collection
Topic 5 Building
Topic 6 Environment
Topic 7 Communication

GENERAL INFORMATION ON THE MUSEUM

Name of the Institution _____

Name of the Director _____

Address _____

Country _____

Telephone _____

Fax _____

e-mail _____

Web Site _____

Number of personnel working in your institution (please, circle one):

< 10 11 / 25 26 / 50 51 / 100 101/250 > 250

Name of the person designated as responsible for emergency and security (if existing): _____

QUESTIONS/INDICATORS

TOPIC 1 *CONSTITUTIONAL FRAMEWORK OF THE MUSEUM*

	YES	NO
1.1 Does the museum have a written statement of its purpose and its goals including its commitments to preventive conservation?	☐	☐
1.2 Does the Governing Body of the museum regularly check on the implementation of preventive conservation?	☐	☐

TOPIC 2 *FINANCE/PLANS*

	YES	NO
2.1 Does your museum have a 3 to 5 year preventive conservation plan?	☐	☐
2.2 Does the museum budget indicate the expenses for remedial conservation (restoration, repair, etc?) (Please enter the remedial conservation percentage of the total budget here …….)	☐	☐
2.3 Does the museum budget indicate a group of expenses for preventive conservation? (Please enter the preventive conservation percentage of the total budget here for future reference ……...)	☐	☐
2.4 Does your museum prepare an annual funding plan for preventive conservation and review its strategies and success in obtaining the funds?	☐	☐
2.5 Does your museum have a written list of sponsors, which could support preventive conservation projects (name of the contact person, name of the institution, address, tel., fax, e-mail, etc.)?	☐	☐

TOPIC 3 *STAFF/TRAINING*

	YES	NO
3.1 Do all the following staff: conservator-restorers, curators, director, educators, guardians, maintenance staff and technicians have a job description, which includes preventive conservation?	☐	☐
3.2 Is a member of staff designated in writing as responsible for co-ordinating preventive conservation of the collections?	☐	☐
3.3 Is a member of staff designated in writing as responsible for documentation and inventory of collections?	☐	☐
3.4 Does the museum have a member of staff who has written responsibilities to lead prevention and response to disasters which could suddenly damage the collection (e.g. theft, malicious damage, fire, flood, earthquake, etc.)?	☐	☐
3.5 Does the museum ensure that staff has the necessary training to implement the museum's preventive conservation plan (for example handling and packing objects, environment monitoring, environment control, planning and management, informing the public, security and emergency situations, etc)?	☐	☐
3.6 Is there a team composed of leading staff members mentioned in point 3.1 that meet regularly each six months to plan and review preventive conservation projects?	☐	☐

TOPIC 4 COLLECTIONS

	YES	NO
4.1 Is there a single written inventory listing each item in the museum collection?	☐	☐
4.2 Does the inventory indicate the location of each item?	☐	☐
4.3 In the last five years, has the museum checked that each entry on the inventory corresponds to an artefact and each artefact has an entry in the inventory?	☐	☐
4.4 If you want an object from your storage can you always find it within 5 minutes? (Please try finding at least 15 randomly chosen objects from the inventory before answering this question)	☐	☐
4.5 Has the museum ever conducted a survey to assess the conservation status of its collections and its preventive conservation needs?	☐	☐
4.6 Has the museum identified the objects that need special preventive conservation because of their importance or vulnerability?	☐	☐
4.7 Does the museum have a written plan to respond to accidental emergencies affecting the collections (e.g. fire, flood, earthquake, and cyclone)?	☐	☐

TOPIC 5 BUILDING

	YES	NO
5.1 Has the museum planned improvements in the use of space that will better protect the collection (reduce movement of collections, improve public and staff circulation, allocate space for special functions, etc.)?	☐	☐
5.2Has the museum building structure (foundation, walls, roof, windows and doors, insulation, etc.) been inspected within the past five years for protection and risks of collections?	☐	☐
5.3 Are the plumbing, heating, air conditioning and electrical systems of the museum inspected regularly each year?	☐	☐
5.4 Does the museum have a plan to provide sufficient storage space for objects that will be added to the collection over the next 10 years?	☐	☐
5.5 Is the storage area used exclusively for museum collections, and not for storing other materials (like old showcases, frames, furniture, instruments, paper, wood, etc.)?	☐	☐

TOPIC 6 ENVIRONMENT

	YES	NO
6.1 Has the museum ever attempted to place the most sensitive collections in the most environmental stable zones of the building?	☐	☐
6.2 Does your museum have an efficient monitoring programme for light?	☐	☐
6.3 Does your museum have an efficient monitoring programme for relative humidity and temperature?	☐	☐
6.4 Does your museum have an efficient monitoring programme for pests?	☐	☐
6.5 Has the museum made plans for improvements to address any problem identified concerning light, relative humidity and pests?	☐	☐

TOPIC 7*COMMUNICATION*

	YES	NO
7.1 Does the museum provide a guide of preventive conservation to all staff, volunteers and researchers, who handle collections?	☐	☐
7.2 Does the museum have a programme to involve the public in caring for collections (e.g. information panels, publications, demonstrations, special events, heritage open days, advice to the public, courses, etc.)?	☐	☐
7.3 Does your museum thank sponsors and funding sources by sending letters, providing reports and acknowledging support in publications and announcements?	☐	☐

SUMMARY TABLE

To have a glimpse of the status of preventive conservation in your museum, colour one cell for each "yes" answer.

TOPIC 1 Constitutional Framework	**TOPIC 2** Finance Plans	**TOPIC 3** **Staff Training**	**TOPIC 4** ***Collection***	**TOPIC 5** Building	**TOPIC 6** Environment	**TOPIC 7** Communication

You can use this table to analyse the situation. For example:

1. If you have coloured at least one cell of each of the seven topics it means that the museum has a balanced approach to preventive conservation;

2. A blank column shows that the museum has a weakness and should start to address it;

3. A completed coloured column shows that the museum is strong in that topic. Keep up the good results and consider the other topics.

Now that you know your strengths and your weaknesses, your team can set priorities and propose a plan of action taking into account the general development of the institution.

II.d. MUSEUM NEEDS ASSESSMENT

The “Museum’s Needs Assessment Questionnaire” has been developped by myself in occasion of my work at the International Council of Museums (ICOM) in 2000. The aim of this questionnaire was to help museums of different region of the world to identify their gaps in terms of all the issues concerned by the modern museology (such as Governance, Governing Body, Staff, Space Allocation, Safety and Security, Collections Management, Research, Preservation and Conservation, Public Relations and Marketing, Exhibitions, Programs/Education, Publications, Training Needs). The list of issues is not exhaustive at all. A selection was done taking into account the diversity of the museums as far as the size, the staff number, the financial resources available, the local capacity, etc.

MUSEUM'S NEEDS ASSESSMENT QUESTIONNAIRE

Table of Contents

A. General Information

Name of the person in charge of the Museum_____

Title/Function

_____

Name of Museum _____

Address (Street or POB)_____

City _____ Postal Code_____

Country

_____

Telephone _____ Fax _____

Web site

_____

Name of the person filling in this questionnaire_____

Date completed: _____

A.1. Specify the type of museum and collections. (Check as many as are applicable.)

A.1.a ( ) Anthropology
A.1.b ( ) Arboretum/Botanical Garden
A.1.c. ( ) Archaeology/Ethnology
A.1.d. ( ) Art
A.1.e. ( ) Aquarium
A.1.f. ( ) Children's
A.1.g. ( ) College, University or School
A.1.h. ( ) General
A.1.i. ( ) Historic Building/Site
A.1.j. ( ) History
A.1.k. ( ) Natural History/Science
A.1.l. ( ) Nature Center
A.1.m. ( ) Planetarium
A.1.n. ( ) Science and Technology Center
A.1.o. ( ) Zoo
A.1.p. ( ) Other (specify)_____

A.2. Complete the following:

Year museum was founded _____

Year museum first opened to public _____

A.3. What is the current population of the metropolitan or regional area in which your museum is located?

_____

A.4. State the museum's annual attendance for the past three years—year by year.

Year	Attendance
_____	_____
_____	_____
_____	_____

A.5. Indicate the museum's target audience(s).
A.5.a. ( ) General public
A.5.b. ( ) Adults
A.5.c. ( ) School children
A.5.d ( ) Other (describe) _____
A.6. Does the museum reach the target audience(s)? ( ) YES ( ) NO

B. Governance

B.1. Is the museum operated by or directly maintained by another institution, society, business, government agency, or organization? ( ) YES ( ) NO

If "YES," give the following information about the parent organization.

Name _____
Address _____
City _____

B.2. Which of the following best describes the museum's governing authority? (The governing authority is the agency or organization that ultimately has legal responsibility for the operation of the museum.)

B.2.a. ( ) College, University, or School
B.2.b. ( ) Local government
B.2.c. ( ) National government
B.2.d. ( ) City government
B.2.e. ( ) Society
B.2.f. ( ) Other _____

C. Governing Body

C.1. Does the director attend and participate in governing authority discussions? ( ) YES ( ) NO

C.2. Does the museum have a formal mission statement? ( ) YES ( ) NO

C.3. Has the museum developed and adopted a long-range plan? ( ) YES ( ) NO

C.4. Does the museum have a process for regular review of the long-range plan? ( ) YES ( ) NO

D. Staff

D.1. Is there an organization chart for the museum? ( ) YES ( ) NO
(If yes, please attach in Annex)

D.2. Does the museum provide opportunities for staff training and development? ( ) YES ( ) NO

D.3. Is there a written formal code of ethics or adoption of the ICOM Code of Professional Ethics? ( ) YES ( ) NO

D.4. Are there written personnel policies? ( ) YES ( ) NO

D.5. Are there written job descriptions for the principal administrative personnel and staff? ( ) YES ( ) NO

D.6. Is the museological education or experience of the majority of the staff appropriate and sufficient to accomplish the mission of the museum? ( ) YES ( ) NO

E. Space Allocation

E.1. Is specific museum space allocated to the following functions?

% of total space

E.1.a. Administration ( ) YES ( ) NO _____

E.1.b. Exhibition Space ( ) YES ( ) NO _____

E.1.c. Education: Auditorium and classes ( ) YES ( ) NO _____

E.1.d. Collections storage ( ) YES ( ) NO _____

E.1.e. Research ( ) YES ( ) NO _____

E.1.f Conservation/restoration ( ) YES ( ) NO

E.1.g. Library ( ) YES ( ) NO _____

E.1.h. Public Services (Meeting Areas, Food, Services, Museum Shop) ( ) YES ( ) NO _____

E.1.i. Buildings and Grounds Services ( ) YES ( ) NO _____

E.1.j. Other (specify)_____( ) YES ( ) NO _____

E.2. What hours and days are the museum's facilities open to the public without advance arrangement? _____

F. Safety and Security

F.1. Does the museum have a formal safety/security program for the collections, personnel and building ( ) YES ( ) NO

F.2. Does the museum have fire detection and suppression equipment? ( ) YES ( ) NO

F.3. Does the museum have a written emergency and evacuation plan for staff? ( ) YES ( ) NO

F.4. Does the museum have a written emergency and evacuation plan for visitors? ( ) YES ( ) NO

F.5. Does the museum have a written emergency and evacuation plan for the collections? ( ) YES ( ) NO

F.6. Are employees trained in emergency procedures? ( ) YES ( ) NO

G. Collections

G.1. List the types of collections of the museum, the number of objects of each type, (i.e., Fine Arts, 300, 10%). the percentages of objects on exhibit.

Types	No. of Objects	% Exhibited
Totals		

G.2. Collection records:

G.2.a. Using the following definition for inventory, indicate percentage of the permanent collection inventoried: _____ _____%

Inventory: The creation of an immediate, brief and permanent record utilizing a control number for an object or group of objects added to the collection, and for which the museum has custody, right, or title. Customarily, an inventory record includes among other data the accession number, date and nature of acquisition, (gift, excavation, expedition, purchase, bequest, etc.), source, brief identification and description, condition, provenance, physical location and movement, value, and name of staff member recording the accession.

G.2.b. Date of last inventory: _____

G.2.c. Inventory system used:

( ) computerized: specify software _____
( ) manual
( ) other (specify): _____

G.2.d. Using the following definition for documentation, indicate percentage of the permanent collection documented: _____ _____%

Documentation: The creation of a full record in complete descriptive detail of all information about an object, assembly, or lot, cross-referenced to other records and files, and often containing a photograph or sketch. Catalog data are usually in the form of cards, sheets, graphic documents, computerized or not.

G.3. Does the museum use collections on loan? ( ) YES ( ) NO

G.4. Are collection records duplicated and kept off-site for security? ( ) YES ( ) NO

G.5. Are there photographic records (images) of the collections? ( ) YES ( ) NO

H. Research

H.1. Is research a major function or activity of the museum? ( ) YES ( ) NO

H.2. Have museum's collections been used for research by outside scholars during the last year? ( ) YES ( ) NO

H.3. Does the museum have a library? ( ) YES ( ) NO

I. Preservation and Conservation

I.1. Are collections regularly surveyed to determine the condition of objects? ( ) YES ( ) NO

I.2. Are records kept on the condition of objects in the collection? ( ) YES ( ) NO

I.3. Does the museum have an in-house conservator? ( ) YES ( ) NO

I.4. Does the museum have in-house facilities for conservation? ( ) YES ( ) NO

I.5. Does the museum have adequate storage facilities for its collections. ( ) YES ( ) NO

I.6. Does the museum have a formal pest (insects and rodents) control program? ( ) YES ( ) NO

I.7. Does the museum have a relative humidity and temperature control program? ( ) YES ( ) NO

I.8. Does the museum have training for staff in the handling of objects in the collections? ( ) YES ( ) NO

J. Public Relations and Marketing

J.1. Does the museum have a public relations/awareness program? ( ) YES ( ) NO

J.2. Does the museum evaluate public awareness? ( ) YES ( ) NO

K. Exhibitions

K.1. Do the exhibitions reflect the museum's mission? ( ) YES ( ) NO

K.2. Is there a process used to select exhibitions? ( ) YES ( ) NO

K.3. Are the exhibitions designed and installed by persons trained in museum display techniques? ( ) YES ( ) NO

K.4. Are the exhibition and public programs regularly evaluated? ( ) YES ( ) NO

L. Programs/Education

L.1. Does the museum have an education program? ( ) YES ( ) NO

L.2. Do the education programs support the mission of the museum? ( ) YES ( ) NO

L.3. Are there training opportunities for staff assigned to the educational functions of the museum? ( ) YES ( ) NO

L.4. Does the museum offer programs for school groups (i.e. tours, teacher workshops, in-school presentations, museum school). ( ) YES ( ) NO

L.5. Are the school programs regularly evaluated? ( ) YES ( ) NO

L.6. Does the museum offer specific programs for the community? ( ) YES ( ) NO

L.7. Are the community programs regularly evaluated? ( ) YES ( ) NO

M. Publications

M.1. Does the museum have a publications program? ( ) YES ( ) NO

M.2. Does the publications program support the mission of the museum? ( ) YES ( ) NO

N. Training Needs

N.1. Please prioritize your museum's training needs in the following subjects, specifying the degree of priority from 1 to 12 (1 = most wanted):

N.1.a. Museology ( )
N.1.b. Museum Management ( )
N.1.c. Collection Management ( )
N.1.d. Preventive Conservation ( )
N.1.e. Education/Interpretation ( )
N.1.f. Communication (including public relations and marketing) ( )
N.1.g Documentation/Inventories ( )
N.1.h. Exhibitions ( )
N.1.i. Museum Security and Emergency Planning ( )
N.1.j. Visitor Studies ( )
N.1.k. Cultural Tourism ( )
N.1.l Fund raising ( )

N.2. If you have other suggestions for training courses, please add here:

Additional Comments:

II.e. QUESTIONNAIRE MEP-TEAMWORK FOR INTEGRATED EMERGENCY MANAGEMENT

I developped this questionnaire in 2005 for ICOM in occasion of the first training course “Teamwork for Integrated Emergency Management” organised in partnership with ICCROM and the Getty Conservation Institute.

Survey
Teamwork for Integrated Emergency Management course
in the framework of the Museums Emergency Program (MEP)

Note: Answers to questions posed in this questionnaire will provide background information that will help the *Teamwork* curriculum reflect the types of situations encountered by participants. This questionnaire is not an application, and will not be used in selecting the institutions that will take part in *Teamwork.*

All of your responses will be treated confidentially and will be seen by only the organizers and teachers of *Teamwork for Integrated Emergency Management*.

Some of the questions will require a written answer, while others may be answered by checking one or more of the appropriate boxes. Please try to answer as many questions as possible. If you require additional space for a written response, please add an additional page.

The completed questionnaire should be submitted **BY ……(date)…….....**
to: **……..**

I General Information

a) Name of the Museum:

b) Address:

c) Telephone& Fax:

d) Email:

e) Website:

f) Date of establishment of the institution:

g) If available, please attach a statement of your mission or purpose

h) Governing authority:
- National government
- State/ regional/ provincial government
- Municipal government
- University or other academic institution

- Religious organization
- Non-governmental, non-profit organization: public/ private
- Other _____

h) If governmental, please indicate the office/ ministry/ agency responsible for the institution: _____

_____

j) Name and position of the person to be contacted for further correspondence:

_____

k) Name and position of the person filling out this questionnaire:

_____

Note: From section II to V, where applicable, kindly answer the questions by checking the appropriate box.

II. Building(s)

2.1 a) How many buildings does your institution occupy? _____

2.1 b) If more than one building, are the buildings located
i) at one site
ii) or several sites

Please indicate **approximately** the size of each building (in square meters).

2.2 Location of your museum:

Urban area Suburban area Rural area

2.3 When was your institution's building (s) built? _____

2.4 Does your building have a special designation or legal protection?

Yes No Not sure

2.5 What are the major materials used in the construction of the walls (e.g., wood, fired brick, unfired brick, stone, concrete, glass etc.)?

_____

_____

_____

2.6 What are the materials used in the construction of the roof (e.g., clay tiles, tar and paper, asbestos, concrete, etc.)?

_____

2.7 Is your building located in an urban and/or congested area? What kind of neighborhood and activities are in close proximity to your buildings?

_____

_____

_____

2.8 Kindly attach photograph(s) with wide-angle view of your building(s).

III Collections

3.1 What is the number of objects in your collection: _____

a) on exhibition _____

b) in storage _____

3.2 Please indicate the percentage of the inventoried items in your collections:

3.3 Please list the types of collections that your institution holds.

3.4 How are the collection used?

- Exhibitions
- Research/ teaching
- Public education / outreach
- Other
  If you have checked 'other', please describe below:

_____

_____

_____

3.5 Please specify the number of buildings in which your collections are exhibited:

_____

And stored:

_____

3.5 a) Also, describe the activities and collections in each.

3.6 Kindly attach one or two wide-angle photographs of your exhibition and storage area/s,

IV People

4.1 What is the total number of people working in your institution? Please include both part-time staff and volunteers, if they work at least 10 hours per week.

_____

4.2 How many people work with the collections? _____
(e.g., curators, keepers, registrars, conservators etc.)

4.3.Please provide the number of people working as:

a) Security guards _____

b) Cleaning and maintenance staff _____

4.4 Are security personnel on duty 24 hrs ?

Yes No

4.5 If no, what are their working hours? _____

4.6 a) Are they museum personnel or provided by outside security firms/contractors?

Yes No

4.6 b) Kindly attach an organizational chart or describe the administrative structure of your museum.

_____
_____

4.7a) Is some of the staff already being trained in risk management?

Yes No

4.7 b) If yes, please specify who (function) and which kind of training (duration, title and subjects, institution organizing the training).

_____
_____
_____
_____
_____
_____

V Potential Risks and Emergency Situations

5.1 To the best of your knowledge, did your institution experience any of the following:

a) Flood

b) Fire (please include small events caused
due to cooking, electric short-circuiting or a cigarette)

c) An earthquake or any other form of physical shock

d) Wind damage

e)Armed conflict/ civil strife

f) Other

Please describe below:

_____

_____

5.2 If yes, were there significant damage or losses to any of the following:

Personnel Collections
Buildings (s) Grounds

5.3a) Does your institution have **written** emergency plans and policies

Yes No Not sure

5.3b) If yes, kindly attach the table contents of the emergency plan.

5.4 What type of emergencies does the plan address?

Civil emergency

Natural emergency (fire, flood, earthquake, etc.)

5.5 Who within the museum have copies of the plan? Please indicate by job titles.

5.6 Are there copies of the plan located at various places in the building and do the appropriate members of staff know the locations?

Yes No Not sure

5.7 Has one copy of the plan been given to the Fire Department, the local Police or to other relevant emergency agencies?

5.8 Has the institution ever conducted a security/ emergency preparedness review with local fire department, the local police or other relevant emergency agencies?

Yes No Not sure

5.9 Have you coordinated your emergency plan with other museums in the region?

Yes No Not sure

5.10 When was the plan introduced?

5.11 When was the current version of the plan last updated?

_____

5.12 Has the institution ever conducted an emergency drill for staff?

Yes No Not sure

5.13 If yes, please indicate the approximate date of the last drill. _____

VI Outreach

6.1 Is the museum staff frequently asked to advise other institutions (small museums, temples, community group, etc.) in the care of their collections?

Yes No

6.2 If yes, please provide a description of a recent example (kindly attach an extra sheet if so required):

_____

6.3 Please describe, in general, the activities your museum has organized involving voluntary groups, local community organization or school/college level students etc.

_____

_____

_____

Other thoughts/comments/suggestions:
(If so required, please attach an extra sheet for your statement)

_____

_____

_____

It would be useful for us if you could kindly attach:

a) Mission statement of your institution
b) Photograph(s) with a wide-angle view of your building(s)
c) Wide-angle view photographs of your exhibition area and storage area(s)
d) Organizational chart/administrative structure.
e) Table of contents of the emergency plan.

II.f. QUESTIONNAIRE MUSEUMS EMERGENCY PROGRAMME –MEP SURVEY

I wrote this questionnaire in 2002 while working at ICOM being in charge of the Museums Emergency Programme-MEP in order to retrieve information world wide on the state of the art on how museums are prepared/or not prepared in case of an emergency. This survey fitted in the first Module of the MEP Programme.

MUSEUMS EMERGENCY PROGRAMME

Preparedness and Response in Emergency Situations

Questionnaire

Name of museum / institution :

_____

Type of museum :

_____

Name of Director of museum / institution :

_____

Address :

_____

City :

_____

Post code : Country :

_____

Telephone :

_____

Fax :

_____

E-mail : Web site :

_____

Name and position of person completing the questionnaire :

_____

Language(s) used in museum : Official language(s) of country :

_____

PART I

❋ If the questions below do not concern your institution, please disregard and proceed to Part II.

1. How many people does the museum employ?

_____

2. Is the museum located

a) In an area where there is a high risk of natural disasters? ( ) YES ( ) NO

Type of disasters concerned (tick boxes) :

- Flooding ( )
- Earthquakes ( )
- Tidal waves ( )
- Hurricanes ( )
- Other (specify)

_____

b) In a political conflict zone? ( ) YES ( ) NO

3. Is there a complete inventory of the collections? ( ) YES ( ) NO

4. Are the museum premises regularly inspected? ( ) YES ( ) NO

5. Does the museum have an evacuation plan :

a) For collections ( ) YES ( ) NO
b) For equipment ( ) YES ( ) NO
c) For people: - visitors ( ) YES ( ) NO
- staff ( ) YES ( ) NO

6. Has the museum ever experienced a disaster? ( ) YES ( ) NO
If yes, state the year(s) and the nature of the disaster(s):

_____
_____

7. Has a disaster response and/or risk prevention officer been appointed from amongst the museum staff? ( ) YES ( ) NO

Details of disaster response and/or risk prevention officer :
Name :

_____
Title :

_____
If any, please specify the training received in risk prevention and disaster response :

_____
_____

8. Has the museum set up a risk prevention and disaster response programme? ( ) YES ( ) NO

If yes, which of the following aspects have been taken into account (tick boxes):

a) Ecological implications ( )
b) Community involvement ( )
c) Local traditional techniques and methods ( )
d) Other ( )

Please give details.

_____
_____
_____
_____
_____

9. Has the museum compiled a list or lists of the objects belonging to collections stating salvaging priorities? ( ) YES ( ) NO

If yes, please indicate criteria used to establish the list : ( )

a) Cost ( )
b) Importance to collections ( )
c) Fragility ( )
d) Vulnerability to particular types of damage ( )
e) Accessibility ( )
f) Maneuverability (size, weight, etc.) ( )
g) Other criteria (give details): _____
_____

10. Is there a place in which emergency conservation treatment of collections can be carried out?

a) In the museum ( ) YES ( ) NO
b) Off-site ( ) YES ( ) NO

11. Can the collections be evacuated to secure premises off-site in the event of a disaster in the museum? ( ) YES ( ) NO

12. If the museum has produced any of the following materials related to disaster preparedness and response, please provide references and if possible, send originals, copies or abstracts.

a) Literature (books, essays, articles, etc.)

_____
_____
_____

b) Didactic material (books, videos, slides, etc.)

c) Other

PART II

13. Could you reccommend any interesting literature and didactic material related to disasters (non) preparedness and (non) response (in your country or elsewhere)? Please provide complete references.

14. Do you know of any organisations and/or experts in your country or region involved in disaster preparedness and response? Please provide contact details.

15. Do you know of an interesting experience related to disaster (non) preparedness and (non) response (in your country or elsewhere) that could serve as a case study? Please provide summary information and indicate contact person or institution.

II.g. DISASTER RELIEF FOR MUSEUMS REPORTING FORM

I wrote this simple disater reporting form while being in charge of the Disaster Relief for Museums initiative at ICOM in 2004.

DISASTER REPORTING FORM

INTRODUCTION

The objective of the Disaster Reporting Form is to collect information about the museums damaged by the catastrophes The Disaster Reporting Form will help to monitor the damages incurred and to identify the first assistance requested.

GENERAL INFORMATION ON THE MUSEUM

Name of the Institution

_____

Name of the Director

_____

Address

_____

Country

_____

Telephone

_____

Fax

_____

e-mail

_____

Web Site

_____

Number of personnel working in your institution (please, circle one):

< 10 11 / 25 26 / 50 51 / 100 101/250 > 250

Name of the person designated as responsible for emergency and security (if existing):

_____

_____

_____

QUESTIONS

Date of the disaster

_____

Date of reporting

_____

Type of disaster Tsunami Earthquake Other

Description of the disaster and impact *(e.g. Community wide / coastal area)*

_____

_____

_____

_____

_____

Description of damage and loss

Staff

_____

_____

Building

_____

_____

_____

_____

Collections

_____

_____

_____

_____

Other

_____

_____

_____

Brief description of first assistance requested (please list in order of priority/urgency)

_____

_____

_____

_____

_____

_____

Institution (Ministries, regional agency, etc.), responsible officer in charge of local response and contact information

_____

_____

_____

Comments

_____

_____

_____

_____

_____

Sources and web links for more information on your museum and the disaster

_____

_____

_____

Form filled in by _____

II.h. ICCROM MANUAL OF COLLECTION RISK MANAGEMENT (ARCHIVE)

April 2009

CASE STUDY
"BAD" BOXES IN ARCHIVES

Context

This example comes from an archive that forms part of a mixed historic collection in a general museum. The purpose of these archives, at present, is purely for the information contained in the documents, and is used primarily by local historians. Often, however, the museum will select a few "interesting" documents that support changing displays in the museum. Overall, the archive is

Risk identification

The museum staff know that a standard piece of best-practice advice is that in an archive, one should replace any and all ordinary cardboard boxes with "archival quality" boxes. Given the cost of "archival" boxes, and the labour, the museum asks: What risk exactly, are we reducing if we replace existing boxes?

Regional historical facts

Based on experience of many observers of damage from ordinary cardboard placed adjacent to white paper sheets for many decades, both in casebound books, and in prints held in place by sheets of cardboard boxes (see examples in the powerpoint on *Making deductions from collection damage* in the Images page) the maximum visible damage over the course of up to 100 years appears to be surface browning of the adjacent sheet, but no penetration of this browning beyond a few fibers thickness of the first sheet. It does not extend beyond one sheet.

Local historical facts

Sheets in boxes that are the oldest, at 30 years of age, do not appear to have any pattern of increased aging adjacent to the box surfaces. Rather, those sheets showing noticeable yellowing, a feeling of brittleness, or the fading of early copier inks, appear to be randomly distributed throughout the boxes, indicating our problem of document aging is one of inherent deterioration of certain types of sheet, rather than of the boxes housing them.

Scientific facts

Although some articles can be found that speculate on mechanisms of possible damage due to migrating acids from acidic sheets, no evidence has appeared in the literature to indicate that measurable strength loss has occurred in stored papers that were adjacent to any "non-archival" cardboards.

Theory

Discussions of the problem of "acid (or other vapour) migration" imply that migration occurs as a gas diffusing from the cardboard, through air, into adjacent sheets. A gas that poses a threat to paper will either a) react and stay where it reacted, or b) behave as a catalyst, then move to the next sheet. The evidence of surface browning suggests mechanism (a).

Risk summary

In the archives, the ordinary cardboard boxes housing the paper records will discolour some of the paper sheets.

Risk scenario, final form

Paper documents in the archive are currently stored in standard office filing boxes, made of cardboard. The age of these boxes is between 1 and 30 years. Each box contains approximately 400 sheets. It is expected that some dangerous vapours from the cardboard, possibly "acids", will migrate into the stack of sheets and discolour and weaken the sheets. Based on available facts and theory, the damage will consist of browning of the outer sheets of each stack of 400 sheets, which will occur in 30-100 years. The archivist considers such browning to be a very small loss of value, since the value of these documents is in their texts. She would prefer to have 10 000 sheets brown on their surface, rather than destroy one and all of its information.

A score: 3½ , 3½, 3

Browning may take 30-100 years to progress halfway into one sheet. Expected case: 30 years, worst case 20 years, best case 100years.

B score: 3, 1, ½

The archivist considers such browning to be a very small loss of value, since the value of these documents is in their texts. She would prefer to have 10 000 sheets brown on their

surface, rather than destroy one and all of its information. In terms of equivalent loss ratio: Expected case:1:10 000. Worst case: the documents' value changes to become significant as historical displays, so 1: 100. Best case: The archivist would sooner brown all documents in the archive than lose one totally, so score as 1:30 000.

C score: 2½ , 2, 2

In the context of this example, the archives constitute only 20%, or 1/5, of the collection value pie. Assume sheets are of equal value. Expected case: 2 sheets out of 400, so 2/400 x 1/5 = 1/1000 of the archive collection. Worst case, sheets are reshuffled over the years, 4 sheets per box are browned, 4/400 x 1/5 = 1/500. Best case same as expected.

Magnitude of Risk (MR): 9, 6½, 5½

Worst case: Medium priority

Expected case: Insignificant risk

Best case: Insignificant risk

Discussion of the uncertainty

The jump from expected case to worst case scenario is large, 2½ units, because the value of the sheets is changed from purely archival in the expected case, to historic and aesthetic in the worst case.

II.i. ICCROM MANUAL OF COLLECTION RISK MANAGEMENT (EARTHQUAKE)

April 2009

CASE STUDY
EARTHQUAKE RISK EXAMPLE

Risk identification

The city is located in an area with a known moderate earthquake risk. One immediately thinks of the ceramics.

Context

Part of a comprehensive survey. Some large ceramics on display are of great historic and aesthetic significance, currently in flawless condition. Considering the collection value pie (in detail elsewhere) the ceramics at risk represent ~10% of the collection value.

Risk summary

Earthquake will cause breakage of unsecured ceramics in the display halls.

Regional historical facts

From the Munich Re world map of natural hazards we find that the museum is located in Zone 2, MM VII for a probability of 10% in 50 years. The MM scale (Modified Mercali)) states that by MM VI "Windows, dishes, glassware broken. Knickknacks, books, etc., off shelves. Pictures off walls. Furniture moved or overturned." At MM VII, "Hanging objects quiver. Furniture broken. Damage to masonry, including cracks. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices (also unbraced parapets and architectural ornaments). Some cracks in masonry."

Local historical facts

Earthquakes have been known in living memory to have caused some noticeable shaking, but the current building is 90 years old and has not been damaged by earthquakes. The display installation is only 20 years old, and no tremors have caused any effects.

Scientific facts

Unknown at present for this risk scenario.

Theory

There is no reason to believe that the current position of the ceramics, and the current attachment of the display cases, which are all “normal,” will reduce the predicted effects of the MM scale. There is also no known reason at present to assume other than typical subsoil or building response (but if this emerges as a major risk, we may consider a more detailed seismic analysis).

Risk scenario, final form

From the Munich Re world map of natural hazards, the museum is located in zone 2, MM VII for a probability of 10% in 50 years. Using a MM scale of effects, we expect the ceramics, not currently secured in any way, to fall off the shelves, and even some of the tall freestanding display cabinets to topple. Further details of the scenario are contained under each score below.

A : paper: 2½ , 2½, 2½ electronic: 2.3, 2.3, 2.3

The earthquake event being considered is the "10% chance in 50 years" so the ~500 year event.

B : paper: 5, 4½, 3 electronic: 5, 4.7, 3

Ceramics that fall will be fragmented but restorable. Expected case: perspective of aesthetics and market value, such breaks reduce value by about 1/2. Worst case total loss of value. Best case considers that the museum wants the ceramics primarily for historical and study purposes. Curator prefers to crack up to 100 ceramics rather than lose 1, but not more.

C : paper: 4, 4, 4 electronic: 4.1, 4.0, 4.0

The most unstable shelving is in the display area. A MM VII earthquake will topple ceramics, and possibly topple freestanding tall cases. Ceramics located on unsafe display shelving are: 1 “national treasure”, 2 “precious local objects”, 100 from the general collection. Expected: those on the high shelves fall, half at floor level topple (1, 1, 50) Worst: all ceramics break. (1,2,100) Best: only those on upper shelves break (1,1,20) These all yield very similar fractions of collection value, about 10%, because despite dozens of general collection ceramics at risk, the total value is dominated in all situations by the 1 national treasure at risk.

Magnitude of Risk (MR):

paper: 4, 4, 4 electronic: 4.1, 4.0, 4.0

Adjusting the example for your situation

Locate your museum on the Munich Re world map of natural hazards. Identify your earthquake risk "Zone" 1,2, 3, or 4. Look in the "Legend" for the MM value of that Zone, (all are for a 10% chance in 50 years, so ~500 year risk. Now use the MM scale (Modified Mercali) to interpret the typical effect on buildings and contents. For example, most of the world is Zone 0, for which the MM value is MM V and below. For MM V we have "Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clocks stop, start, change rate."

For MM IV, "Vibration like passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing motor cars rock. Windows, dishes, doors rattle. Glasses clink. Crockery clashes." Imagine how your collection cases, shelves, cabinets might respond. There are numerous websites with images and descriptions of museum and library earthquake response to guide you. In addition, check local historical record, residents memories. If you are in a high earthquake risk zone, these will be abundant, as well as much more detailed expert advice.

III INTERNATIONAL DECLARATIONS/CHARTES/RECOMMENDATIONS ON DISASTER RISK MANAGEMENT

III.a. Hyderabad Recommendations
III.b. Kyoto Declaration
III.c. Davos Declaration
III.d. Regensbourg Declaration
III.e. Olympia Protocol

- Convention concerning the Protection of the World Cultural and Natural Heritage, UNESCO, 1972 ; http://whc.unesco.org/archive/convention-en.pdf accessed on 15 August 2008.

- Final Recommendations of the International Course on Preventive Measures for the Protection of Cultural Property in Earthquake Prone Regions, Skopje, Yugoslavia, 1985 (Stovel, ICCROM 1998)

- Conclusions and the Recommendations of the International Workshop on Structural and Functional Rehabilitation of Housing in Historic Buildings in Seismic Regions, Mexico City, 1986 (Stovel, ICCROM 1998)

- Council of Europe, Committee of Ministers, Recommendation No. R(93)9 of the Committee of Ministers to Member States on the Protection of the Architectural Heritage against Natural Disasters, adopted by the Committee of Ministers on 23 November 1993 at the 503rd Meeting of the Ministers' Deputies (ICOMOS H@R 2008)

- Declaration of Quebec, Ist National Summit on Heritage and Risk Preparedness, Quebec City, Canada, 1996. (Stovel, ICCROM 1998)

- The Kobe/Tokyo Declaration on Risk Preparedness for Cultural Heritage, Kobe/Tokyo International Symposium on Risk Preparedness for Cultural Properties, 1997

- Radenci Declaration, Blue Shield Seminar on the Protection of Cultural Heritage in Emergencies and Exceptional Situations, Radenci, Slovenia, 12-16 November 1998, http://www.ifla.org/VI/4/admin/emergcy.htm accessed on 15 August 2008

- Declaration of Assisi by ICOMOS Scientific Committee for the Analysis and Restoration of Structures of Architectural Heritage, 1998 (Stovel, ICCROM 1998).

- Torino Declaration. Resolutions of the First Blue Shield International Meeting, Torino, Italy, 2004. http://www.ifla.org/VI/4/admin/**torino-declaration**2004.pdf accessed on 15 August 2008

- Kyoto Declaration 2005 on the Protection of Cultural Properties, Historic Areas and their Settings from Loss in Disasters (adopted at the Kyoto International Symposium 2005 "Towards the Protection of Cultural Properties and Historic Urban Areas from Disaster" held at Kyoto Kaikan on 16 January 2005); http://www.international.icomos.org/xian2005/kyoto-declaration.pdf accessed on 15 August 2008

- Recommendations of the UNESCO/ICCROM/Agency for Cultural Affairs of Japan – Thematic Meeting on Cultural Heritage Risk Management, World Conference on Disaster Reduction, Kobe, 2005.
  http://www.icomos.org/australia/images/pdf/Tsunami/**Japan**%20**recommendations**.pdf
  accessed on 15 August 2008

- United Nations Educational Scientific and Cultural Organization, Convention Concerning the Protection of the World Cultural and Natural Heritage, World Heritage Committee, 30th Session, Vilnius, Lithuania, 8-16 July 2006, Paris 2006, http://whc.unesco.org/download.cfm?id_document=6525 accessed on 15 August 2008

- Declaration on the Impact of Climate Change on Cultural Heritage, International Workshop on Impact of Climate Change on Cultural Heritage, New Delhi (India), 22 May 2007 (ICOMOS News, June 2008)

III.a. HYDERABAD RECOMMENDATIONS

INTERNATIONAL SYMPOSIUM ON
CULTURAL HERITAGE DISASTER PREPAREDNESS AND RESPONSE
Hyderabad, India
23 - 27 November, 2003

WORKING GROUP 1

Community Responsibility and Involvement in Emergency Preparedness and Response

Chair
Larry Armony, St Kitts and Nevis

Rapporteur
Aparna Tandon, India

Per Kåks, Sweden
Abdul Ahad Abassi, Afghanistan
Mikhail Koltsov, Russian Federation
Yonten Dargye, Bhutan
Freda Nkirote M'Mbogori, Kenya
Chantal Radimilahy, Madagascar
Pascal Makambila, Congo
Chedlia Annabi, Tunisia, ICOM-Arab (Regional Alliance for the Arab States)

+ INDIAN PARTICIPANTS

Kathy Dardes and Katharine Untch of the Getty Conservation Institute, Jan Hladik of UNESCO, Maria Teresa Dutli of the International Committee of the Red Cross, Manus Brinkman and Cristina Menegazzi of the International Committee of Museums were circulating among the three groups.

Introduction Paper by Mrs. Chantal Radimilahy
Introduction Paper by Ms. Aparna Tandon

Introduction

The first issue arising from the discussions was a definition of 'museum', which would accord to the realities of all territories and states of the world. It was recognizes that the International Council of Museums (ICOM)'s definition of a museum as a "non-profit making, permanent institution in the service of society and of its development, and open to the public, which acquires, conserves, researches, communicates and exhibits, for purposes of study, education and enjoyment, material evidence of people and their environment. (…)" (ICOM, 1990) would exclude many institutions which manage the cultural heritage that exists beyond the walls of a conventional museum; that such a definition was derived from the European experience with roots in somewhat elitist traditions; and that it is incongruous with the

essential objective of ICOM, which is to conserve, protect and interpret the world's cultural heritage.

It was therefore agreed that sacred places, archaeological sites, monuments, building and other structures indicative of a peoples' culture and heritage, should be included at least for the purposes of this project.

Another issue concerned the definition of 'community'. It was agreed that the 'community' served by any museum comprised many constituent parts or elements; and that to properly devise a strategy for disaster preparedness and response, these elements had to be addressed singly and collectively. The constituent elements include local and national communities, service organizations, governmental agencies, NGO's, private sector organizations, first responders to disasters, etc. A complete list is annexed.

The discussion then centered on a consideration and categorization of the disasters to which museums as defined above are susceptible. This categorization was based upon that provided by Prof. Patrick J. Boylan in his paper presented at the symposium. It includes natural hazards, civil disasters and armed conflict, to which the category biological hazards was added. It was recognized further that many disasters could result from negligence on the part of the museum institution/staff, and that a major loss of audience and/or substantial decline in visitation could be the result of management deficiencies.

Discussions

There were wide ranging discussions in which members of the groups fully participated. The themes included:

a) The risk to cultural heritage posed by civil strife and armed conflict, ethnic tensions and terrorism.

b) The problems resulting from the lack of autonomy of museums in some parts of the world.

c) Representation of a nation's cultural diversity in the context of a national museum versus the individual presentations of the various ethnic/cultural constituents of a nation.

It was accepted by consensus that (a) attempts should be made by the museum fraternity to engage civil, ethnic and separatist operatives in dialogue so as to communicate the value of heritage to all constituents and of the need to share the role of protectors; (b) cross border collaborations between museums and allied institutions could lead to a greater recognition by governmental authorities of the management roles of museum professionals; (c) while ideally 'national museums' promoted national unity, regional and other museums of particular ethno-cultural groups were not necessarily inimical to national solidarity and could give people a sense of belonging to the shared heritage of their country.

Recommendations

The recommended strategies for plans of actions to involve the community (as defined) are summarized below:

- Museums must first educate and train their own staff members in disaster preparedness and response through workshops, mock exercises, and ongoing monitoring. This would necessarily involve informing themselves of the various existing Conventions as well as current knowledge on the subject.

- Through interpretation and the design of its exhibitions museums should attempt to educate visitors about the importance as well as methods for the protection of the cultural heritage.

- Museums must construct a 'map' of the community so as to identify and locate the various constituents in order to establish their various roles in disaster preparedness and response.

- Traditional methods of disaster preparedness and response should be investigated so as to integrate them where applicable with established systems.

- Museums should identify the disasters to which they are particularly susceptible and ensure that they possess the tools and equipments to effectively mitigate and respond.

- Governmental bodies and politicians and other influential persons and institutions should be invited to serve on museums boards and to visit the museums so to win their support for facilitating protection of cultural heritage.

- A dialogue should be entered into between fire fighting units, police and civil defense, public works and utilities so as to acquaint them with ways in which they could assist and collaborate in protection of cultural heritage.

- The local branches of the International Red Cross and other international disaster response agencies should be involved in training and disaster mitigation.

- Exchanges among museums and other institutions should be promoted so as to establish support networks.

- Recommendations should be made to ICCROM, ICOM, ICOMOS and other international agencies to the effect that: (a) workshops and training sessions be organized at regional levels to train museum personnel so that they can in turn extend such training to a wider group, (b) a database of case studies be established, evaluated and made accessible to the museums and related institutions of the world.

WORKING GROUP 2

Preserving the environment and local traditions in emergency preparedness and response

Chair
André van der Goes, Germany

Rapporteur
Nevra Erturk, Turkey

Doris Maza Garcia, Puerto Rico
Théodore Aglassa, Benin
Ibrahim Bin Ismail, Malysia
Murillo Marx, Brazil
Salvator Ntakarutimana, Burundi
Nimal De Silva, Sri Lanka
Rohit Jigyasu, India
Pienke Kal, The Netherlands

+ INDIAN PARTICIPANTS

Kathy Dardes and Katharine Untch of the Getty Conservation Institute, Jan Hladik of UNESCO, Maria Teresa Dutli of the International Committee of the Red Cross, Manus Brinkman and Cristina Menegazzi of the International Committee of Museums were circulating among the three groups.

Introduction Paper by Mrs. Doris Maza Garcia
Introduction Paper by Mrs. Pienke Kal

Definition

Considering that cultural heritage is a product of environment and local traditions, it is necessary to consider their importance/potential for preparing practical and acceptable plan in response to emergency situations.

Statement

Recognizing the important aspect of cultural heritage, local, regional, national, and international institutions, organisations, international charters and conventions should pay an active role in preparing and implementing the necessary framework/guidelines required for the effective implementation through preventive measures to mitigate the risk from man-made and natural disasters measures to a swift and adequate response for probable disasters.

Improvement of Risk Preparedness

a) Strengthening institutional frameworks
b) Funding
c) Emergency management
   - preventive
   - response
   - long-term: to ensure long-term sustenance, it is necessary to incorporate diverse traditional beliefs, practices and knowledge
d) Research and documentation of tangible and intangible heritage to record existing and to recover lost traditions and practices that may have potential to improve policies and practices for risk preparedness.
e) In order to prepare and implement an effective emergency plan, it is important to seek community participation at all levels

Using instruments and tools to enhance the effectiveness of emergency management plans through:

- Training museum staff and local volunteers in the community.
- Mass education awareness programs using appropriate communication methods.
- Building sustainable networks and partnerships at various levels.
- Using local and appropriate knowledge and technology.
- Inventory and documentation of the physical conditions of the museum buildings and their environment.
- Developing international partnership of museums and local institutional networks is necessary for the preservation of cultural heritage and exchange of experience.

- Cooperation with ICOM with ICOMOS and international institutes such as ICCROM, IFLA, ICA is necessary to create a synergy of efforts and access to these institutions and their database via electronic medium must be possible.

- Cooperation of ICOM, ICOMOS, ICCROM with external relevant partners such as the Getty Conservation Institute opens the possibility for training of key people and large scale implementation of successful emergency management programs.

- Trained museum personnel and emergency services should be available when cultural heritage is threatened in a community.

- Cooperation with institutions, where conservators and conservation architects, are being trained in order to broaden the scope t museum personnel in emergency situations.

- Clear demarcation of various responsibilities, activities among different stakeholders in emergency management plans.

- ICOM National Committees in each country should lead and coordinate the efforts and advocate emergency planning. ICOM should take the leading role in coordinating on a global scale the participation of each country in order to pursue on effective emergency planning.

WORKING GROUP 3

Networking: coordination and collaboration among diverse institutions and organisations in emergency preparedness and response

Chair
Manuel Lopez Iglesias, Spain, Médecins sans Frontières

Rapporteur
Barbara Roberts, United States of America

Patrick Boylan, United Kingdom, ICTOP (ICOM Inter. Comm. For the Training of Personnell)
Luis Repetto, Peru, ICOM-LAC (Regional Alliance for the Latin America and the Caribbean)
Jean-Aime Rakotoarisoa, Madagascar, AFRICOM (African Committee of Museums)
Giovanni Pinna, Italy, National Committee of the Blue Shield
Edward Hernandez, Trinidad and Tobago
Corine Wegener, United States of America
Jørgen Wadum, Danemark, ICOM-CC (Inter. Comm. for Conservation)
Franz Grupp, Peru
Miguel Herrera, Costa Rica
Ruben Sanchez, Argentina
Mwadime Wazwa, Kenya, Programme for Museums Development in Africa
Pavel Jirasek, Czech Republic, ICMS (Inter. Comm. for Security)
C.B. Patel, India
Kennedy Nyewan, Liberia

Kathy Dardes and Katharine Untch of the Getty Conservation Institute, Jan Hladik of UNESCO, Maria Teresa Dutli of the International Committee of the Red Cross, Manus Brinkman and Cristina Menegazzi of the International Committee of Museums were circulating among the three groups.

Introduction Paper by Mr. Herrera
Introduction Paper by Mr. Wazwa
Introduction Paper by Mr. Sanchez
Introduction Paper by Dr. Shrinivasan

Introduction

In the spirit of the Kobe/Tokyo International Symposium, and the Hyderabad gathering, Working Group 3 submits the following recommendations to ICOM.

Recommendations to ICOM

- ICOM Executive Council should meet with the ICBS Board to develop a functional, operational structure for response to emergency situations.
- ICOM will work to enhance the ability of ICBS to fulfil its commitment to the Second Protocol of the Hague Convention.
- ICOM Executive Council should call on specialists in the field to assist in developing an emergency response network.
- ICOM should reform the objectives of national committees to include the imperative of inclusion of emergency preparedness and response into national deliberations so that they may ACT in emergency situations.
- ICOM should take the opportunity of the present review of the Code of Ethics and Statutes to include a chapter on the protection of cultural heritage in emergency situations.
- Require National Committees to present, to the Secretary General, assessments of conditions in their countries as regards preparedness and response capabilities as soon as possible.
- To be effective, cultural emergency response teams need an operational support structure (ICOM Secretary General should review the structure of Médecins Sans Frontières, Red Cross/Red Crescent and others and propose to the Executive Council a cultural property emergency response mechanism).
- Create an adequate communication structure, including building relationships with the media and the press and administrative and political bodies.
- Create a collection point for information on emergency preparedness.
- ICOM is not yet recognized as a first responder who could assist nationally or internationally and a protocol is needed to make this happen.
- Develop standard operating procedures to prepare for emergency response.
- Create a staffed, permanent task force for emergency response.
- Create a database of specialists and professionals drawing on ICOM members and other organizations who may assist in emergency response and training.
- Missions would include:
  - Assessment on site (before and after the crisis)
  - Professional training programs and response
  - Training of museum professionals
  - Training of non-museum professionals
  - Assist cultural property organizations in writing emergency plans
  - Prepare ethical guidelines for emergency response

- The Secretary General of ICOM should encourage the ICOM National Committees to co-operate with local, religious and governmental authorities as well as other cultural organizations holding cultural heritage in Emergency Preparedness.
- As a tool for Emergency preparedness there should be a Web Site to be used for example for emergency plans for local cultural institutions.
- Governmental authorities should be urged to support emergency preparedness and action plans. Special attention should be paid to documentation and inventories both in situ and in fondo.
- National Committees of ICOM should create local information networks with religious and other cultural organizations dealing with emergency preparedness.
- National Committees of ICOM should ensure that emergency plans are integrated with local state and national plans.

Networking: Communication and Information

We accept that MEP is a recent initiative of ICOM. ICOM should adopt these following priorities: raise awareness generally among all museum people, holders of collections and relevant outside bodies (emergency services etc.) of the need for emergency preparedness & planning.

Priorities should include:

- Promote MEP through *ICOM News* – MEP news column in each issue.
- Develop MEP website within icom.museum web service.
- E-mail information and discussion list for MEP.
- Recommend developing *Intranet* system in support of MEP development (will need funding for this).

ICOM should adopt these information priorities: provide relevant information on emergency preparedness, response and recovery for the benefit of all museum people, holders of collections and relevant outside\bodies (emergency services etc.).

Priorities will include information on:

- Existing relevant networks and sources, centres of excellence, training programmes and resources.
- Make available existing documents in various formats (web, CD, physical copies in regional documentation centres and museums, particularly those of the MEP partners (ICOM, ICOM International Committees eg. ICOM-CC, ICMS & ICTOP), ICCROM, GCI), also other relevant bodies with existing material, e.g. UNESCO, Other Blue Shield member organisations.

Types of material needed:

- Official documents, such as International treaties and agreements and information on their application (eg. Hague Convention, Geneva Conventions, regional Agreements).
- Working Papers (e.g., of this meeting).

- Case studies and model emergency systems as examples of good practice.
- Training resources and programme details.

New material:

- Identify needs in relation to the development of new material of all kinds relating to the MEP project

- Seek cooperation of National Committees (and relevant Regional International Committees (particularly ICOM-CC, ICMS, ICAMT) to provide lists and details of incidents on a confidential basis of museum emergencies (of all kinds – from minor vandalism through the catastrophic disasters) , including cases in which the risk has been successfully avoided or contained.

Legal issues:

- Negotiate copyright agreements for the posting of material on the proposed website, and for its distribution in various forms (photocopies, printed publications, distribution on CDs. (We propose that the MEP partners in particular should be approached on this as soon as possible.)

Languages:

- All material would be made available in the original language; if not in one of the three ICOM languages should have an abstract.
- We envisage and encourage the National Committees of ICOM to be very active partners in providing both abstracts and – eventually – full translations into national and local languages

Final Note:

We request that ICOM declare an International Awareness day or week to the topic of "Cultural Property, Response and Recovery in Emergency Events".

III.b. KYOTO DECLARATION

KYOTO DECLARATION 2005

On the Protection of Cultural Properties, Historic Areas and their Settings from Loss in Disasters

(adopted at the Kyoto International Symposium 2005 “Towards the Protection of Cultural Properties and
Historic Urban Areas from Disaster” held at the Kyoto Kaikan on 16 January 2005)

Cultural Properties and Historic areas are irreplaceable cultural and social resources and a yet under utilized resource for sustainable development for the benefit of mankind, which should be handed down to future generations.

However, catastrophic hazards such as fires and tsunami caused by earthquakes, typhoons, floods and other disasters, pose grave threats, especially in the countries of Asia and Circum- Pacific region.

Through the reports of the participants of " ICOMOS-Japan International Expert meeting on Risk Preparedness for Cultural Heritage in Asia and Circum-Pacific Region " on the cultural heritage at risk and challenges confronting risk preparedness of cultural heritage in each country, and also on the basis of site inspection, with the cooperation of the people of the Kiyomizu Temple World Heritage Site and the surrounding Sanneizaka preservation district for Groups of Historic Buildings, we recognize the exceptional values that are embedded in the Cultural Properties and Historic Urban Areas, but at the same time also comprehend the risks to World Heritage Sites and the surrounding areas to earthquake, typhoon, flood and other disasters and that appropriate actions should be taken to improve their resilience.

While considering the probability of consequential fires after earthquakes resulting from insufficient preparedness, we recognize that such cultural resources are vulnerable to

such hazards; not only in Kyoto but also in the world and that a priority list needs to be developed to focus attention and resources to improve the Historic Built Environment.

However, considering the opportunity provided by the UNESCO World Heritage Convention for member states to take positive and effective measures in relation to risk preparedness at World Heritage Sites by undertaking the following activities as stated in Article 5 of the convention text:

- Integrating the protection of cultural heritage into national comprehensive planning programs [according to section (a) of Article 5]
- Developing scientific and technical studies and research and to work out such operating methods as will make the state capable of counteracting the dangers that threaten its cultural heritage [according to section (c) of Article 5], and
- Taking appropriate legislative, scientific, technical, administrative and financial measures [according to section (d) of Article 5]
- And also recognizing the great achievement of the Japanese government in stating a policy for disaster prevention of cultural properties and historic urban areas in "The Guidelines for Earthquake Disaster Prevention of Cultural Heritage and Surrounding Site" issued by the Cabinet Secretary of Japan in 2004.

We the participants of Kyoto Public Forum and ICOMOS-Japan International Expert Meeting on Risk Preparedness for Cultural Heritage in Asia and Circum Pacific Region, recommend that:

1. Retrofitting and Community Infrastructure Upgrading needs to be systematically initiated to prevent loss of irreplaceable cultural resources due to disaster.
2. The information base for action programmes needs to be created and expanded to apply existing knowledge and new methods.
3. The past wisdom and experiences in disaster prevention, which were inherent in traditional local communities, and in cultural properties, historic areas and their settings should be preserved and/or recovered.
4. The environment surrounding heritage properties should be considered in the disaster prevention measures.
5. A comprehensive national policy of disaster prevention for cultural properties, historic areas and their settings needs to be formulated by States Parties who have ratified the World Heritage Convention.

6. The need for coordinated action by national and local governments should be emphasized to create an awareness of, and financial resources for addressing Historic Urban Area issues, improvement programmes and their implementation.
7. Outreach programmes in which governance and heritage interests are linked should be established in partnership with local government and universities, NGOs, and heritage entities; financial support from domestic capital markets should be provided to improve risk preparedness strategies in the present cultural heritage management measures; and clear delegation of responsibility and collaboration among various government departments should be promoted in disaster prevention and mitigation measures for cultural heritage.

   National and local governments should develop capital investment plans based on socially, culturally, economically, environmentally and technically viable sustainable risk reduction programmes.

Therefore we, the panelists of the Kyoto international symposium, "Towards the Protection of Cultural Properties and Historic Urban Areas from Disaster" and the participants of the "ICOMOS-Japan International Expert meeting on Risk Preparedness for Cultural Heritage in Asia and Circum-Pacific Region", hereby declare that

1. Cultural heritage is a priceless and non-renewable human asset and it is our duty to raise awareness and undertake all necessary measures for protection of cultural heritage from disasters.
2. Cultural heritage embodies accumulated knowledge in disaster prevention based on past experiences and traditional practices, together with modern science and technology, which should be researched and integrated into disaster prevention measures.
3. Disaster prevention measures should address cultural heritage comprehensively, rather than in isolation, through the planning process and programmes, and in coordination with various cultural institutions, urban planning and other departments. While undertaking disaster mitigation, it is essential to adopt a coordinated multi-agency approach to cultural heritage management, in which measures for risk preparedness are integrated through effective partnerships and appropriate funding

4. While establishing mitigation measures to protect cultural heritage from disasters, the responsibility of various bodies should be clarified at all levels.
5. Undertake collaboration through international networks, especially in the earthquake prone Asia and Circum-Pacific Region, to establish project development task forces.

And consequently,

We, the participants of these meetings, ask for the improvement of disaster prevention measures in Kyoto as part of national policy and to further establish a global benchmark by setting the standard for cultural heritage disaster prevention.

Furthermore, we strongly urge all the States Parties and the concerned inter-governmental and non-governmental institutions to build an international network among experts and all those concerned with cultural heritage disaster prevention.
We also urge regional development banks to support lending programmes through national and local government; to be members of project development teams to build support systems for historic urban areas; and to organize forums for mutual cooperation and information exchange.

The “Kyoto Declaration 2005 on Protection of Cultural Properties, Historic Areas and their Settings from Disaster” (hereinafter the Kyoto Declaration) was adopted at the Kyoto International Symposium 2005 “Towards the Protection of Cultural Properties and Historic Urban Areas from Disaster” held at the Kyoto Kaikan on January 16th, 2005, organized by Japan ICOMOS National Committee; Executive for ”10 years Anniversary of World Heritage Registration” (Kyoto City, Preservation Technology Foundation for Cultural Heritage Building ; all Japan Preservation Corporation for Roof Building Technique of Shrine and Temple; Kyoto Foundation or University Consortium; Kyoto City Preservation Foundation for Cultural Sightseeing Resources); Ritsumeikan University COE Program; Research Center for Disaster Mitigation of Urban Cultural Heritage Conference for Protection of Cultural Heritage from Earthquake Disaster and the NPO for Protection of Cultural Heritage from Disaster.

The drafting of the Kyoto Declaration began as a discussion in a small working group convened by Mr. Kanefusa Masuda, acting as coordinator of the International Expert

meeting on Risk Preparedness for Cultural Heritage in Asia and Circum-Pacific Region 2005. This working group consisted of Prof. Takeyuki Okubo, Prof. Rohit Jigyasu and Prof. Kanefusa Masuda. Under the leadership of Prof. Okubo, the working group discussed elements to be included in the Kyoto Declaration for three months prior to the symposium. The outcomes of the working group's discussion were presented at the meeting of panelists and participants on 16th January, and after discussion the draft of the Kyoto Declaration was produced. The draft Kyoto Declaration was subsequently presented at the Kyoto International Symposium.

The panelists who participated in drafting the "Kyoto Declaration 2005 on Protection of Cultural Properties, Historic Areas and their Settings from Loss in Disasters" are as follows (in alphabetical order).

- Azhar Tyabji (Preservation Planner, HCP Design and Project Management Pvt. Ltd., India)
- Hiroshi Adachi (Professor, Architecture Division, Faculty of Engineering, Kobe University, Japan)
- Damin Wang (Assistant Director, World Heritage Division, State Administration of Cultural Heritage, China)
- Dhammika Priyantha Chandrasekara (Lecturer, Moratuwa University, Sri Lanka)
- Dinu Bumbaru (Secretary General of ICOMOS International)
- Earl Kessler (Deputy Executive Director, Asian Disaster Preparedness Center (ADPC), Asian Institute of Technology (AIT), Thailand)
- George Okello Abungu, (Guest Scholar from Kenya, The Getty Conservation Institute, United States)
- Hae Un Rii, (Vice President of ICOMOS-Korea, Professor, Department of Geography, Dongguk University, Korea)
- Joseph King (Acting Unit Director, Heritage Settlements Unit, ICCROM)
- Kanefusa Masuda (Professor, Research Center for Disaster Mitigation of Urban Cultural Heritage, Ritsumeikan University, Japan)
- Khizer Farooq Omer (Manager Planning, Monitoring and Evaluation, Aga Khan Planning and Building Service, Pakistan)
- Khalid El Harrouni (Professor, Ecole Nationale d'Architecture, ICOMOS Morocco)

- Masami Kobayashi (Professor Dr. Eng., Graduate School of Global Environmental Studies, Kyoto University, Japan)
- Masaru Maeno (President of Japan-ICOMOS, Japan)
- Prem Nath Maskey (Professor, Department of Civil Engineering, Institute of Engineering, Pulchowk Campus, Nepal)
- Randolph Langenbach (Building Conservation Architect, ICORP)
- Robyn Riddett (Associate Director, Allom Lovell and Associates, Conservation Architects, Australia), Secretary, ICORP
- Rohit Jigyasu (Visiting Professor from India, Research Center for Disaster Mitigation of Urban Cultural Heritage, Ritsumeikan University, Kyoto, Japan)
- Mehrdad Hejazi (Associate Professor, University of Isfahan, Iran)
- Soeroso, Director for Archaeology and Museums, Department of Culture and Tourism, Indonesia.
- Takeyuki Okubo (Associate Professor Dr. Eng., Graduate School of Global Environmental Studies, Kyoto University, Japan)

III.c. DAVOS DECLARATION

IDRC Davos 2006 Declaration

Participants' self-commitment for action

We, the 900 participants of IDRC DAVOS 2006, declare our self-commitment and will to actively support and implement the conference recommendations on a regular basis in our daily work and communicate these recommendations to the wider community. Hereby, we call upon the international community to join us in this effort. Our declaration aims at drawing attention to the
issues listed below.

Preamble
The IDRC Davos 2006 Conference, a multicultural, inter- and transdisciplinary gathering with 900 participants from almost one hundred countries, supported the objectives of disaster risk management as outlined in the *Hyogo Framework for Action 2005-2015: "Building the Resilience of Nations and Communities to Disasters"*. Special attention was given to the implementation in the community - at the "last mile"

The Conference provided a forum for decision makers, scientists and practitioners to exchange ideas on how to cope with disasters and risks using state-of-the-art methodologies.

The conference discussed:

1. Risks related to natural hazards and technological failures, as well as emerging human-induced risk factors such as pandemics, terrorism or climate change, in a truly integrated and participative approach.

2. Measures to identify, assess and monitor disaster risks and enhance early warning.

3. The need to prioritize the mainstreaming of disaster risk reduction into development polices, to transfer the knowledge, and develop the technology and education with the involvement of the communities at risk to build a culture of safety.

General Findings and Recommendations

Integrated risk management and sustainable development:

- The conference reinforced the idea that to achieve the Millennium Development Goals (MDG), disaster risk reduction has to become an important and comprehensive part of the whole planning process for poverty reduction, food and water security, education and health – thus risk management must become an important part of national policies and strategies.

- We need to adopt an integrative, multi-disciplinary approach and bring representatives from the public and private sector, NGOs and academia to "the table" to discuss disaster prevention, mitigation, response and recovery.

- Disaster risk management has to concentrate more pro-activelyon prevention and preparedness to reduce an adverse socioeconomic impact on the MDG. Rapid intervention and response during and carefully planned recovery after a disaster may limit subsequent losses and damages. Disaster risk management should be viewed as a process rather than a solution.

- Decision-makers have to include disaster risk management in their national planning and budgeting process, rather than waiting till disasters strike before they react.

o Institutional capacity building needs to be matched up with human capacity building, so as to have strong and efficient institutional mechanisms and as well as strong and efficient people in developing areas who are empowered to deal with disaster events themselves, before assistance comes their way.

- In addition to focussing on basic needs (food, water, shelter), infrastructure and environment, it is important to have preparedness plans addressing people's social, psychological and emotional needs, thus involving those people directly affected.

- National strategies that integrate all types of risks and measures are needed. Disaster risk management and natural resource management have to go hand in hand.

- Presently available tools for hazard analysis, vulnerability assessment, risk appraisal, tolerability and acceptability judgments shall be used for a comprehensive disaster risk management to reduce risks and to build the resilience of the community. There is further need to enhance the tools for their practicality, especially for vulnerability assessments and priority setting in risk reduction measures.

- In designing community and rural risk management plans, the focus must be to protect people, as well as livestock and other agricultural assets,in order to preserve livelihoods, and reduce poverty, hunger, water shortage and the spread of zoonotic diseases.

- **Gender and disasters**:
- Gender issues are an integral part of disaster risk reduction and it is imperative that the specific needs and contributions of both men and women are taken into consideration in practice, science, evaluation, policy and decision making.

- Communities at risk can benefit tremendously by using women and children as a change agent. We need to capitalize the potential of women and children and their effectiveness to contribute to the reduction of disaster risks.

- The specific vulnerability of women and children in disasters has to be taken into account. This requires awareness raising and capacity building of planners, decision makers and practitioners.

- Collected data needs to be separated into categories of different gender and age groups before being analyzed.

- **Environmental vulnerability**
- Environmental degradation, whether creeping change or acute emergencies, poses a grave risk to human communities.

- The management of ecosystem services should be recognized as an integral part of disaster risk management.

- Estimates of cost-effectiveness are an important tool in deciding on the mix of using nature with its potential and man-made eco-engineered or technical disaster reduction measures.

- Some disaster reduction and recovery efforts can have adverse environmental consequences – these should be avoided as much as possible.

- Ecosystem services based management, environmental engineering solutions, mitigation of greenhouse gases, climate change adaptation and integrated water resource and catchment area management all support the goals of disaster risk reduction.

- **Research, education, awareness and capacity building**
- We believe that education for disaster reduction should form an integral part of the United Nations Decade of Education for Sustainable Development (2005-2014).

- It is necessary to build the ability to reduce losses, as well as the capacity to respond to, and to recover effectively from extreme events when they do, inevitably, occur.

- A better working relationship between the scientific community and end–users, be they mitigators, planners, educators, communicators or responders, is of prime importance. The end-user's needs must be better articulated and the knowledge management improved. A scientific approach and international collaboration are encouraged.

- The availability of temporally and spatially accurate, relevant and usable information is essential to all aspects of disaster reduction. The development and enhancement of processes and infrastructure to acquire, manage, and share information across sectors, combined with the ability to make well founded decisions will substantially increase the efficiency and effectiveness of all aspects of disaster risk reduction.

- Knowledge transfer and capacity building shall contribute substantially to disaster risk reduction.

- Concern for heritage, both tangible and intangible, should be incorporated into disaster risk reduction strategies and plans, which are strengthened through attention to cultural attributes and traditional knowledge.

- **Terrorism and human security**

- Transnational terrorism has developed into a worldwide threat. Community based disaster risk reduction strategies have to take this threat into account.

- As poverty, lack of good governance and economic and political instability are fertile ground for terrorism to flourish, this has to be addressed in a way so as to encompass its comprehensive dimension.

- Close international cooperation and mechanisms for forecasting, early warning and information exchange are needed to cope with this threat.

- **Regional dimensions**
- Regional variations in disaster risk management awareness and abilities, in vulnerability and resilience are a fact. The unique needs, challenges and existing capacities of China, Central Asia and Africa were highlighted throughout the conference.

- Participants from Africa (annex 1) took the opportunity to advance plans for promoting mutual interest and cooperation in disaster risk reduction for safer, more disaster resilient communities and issued position papers outlining details in this regard.

- For the Central Asian delegation, adopting the principles of the integrated water resources management and increasing the activities of coordination at the national, interstate and global level will offer a good chance to reduce vulnerability. Actions should give priority to the human needs for water and should include the principals of the integral risk management for natural and man-made hazards (annex 2).

- Indigenous knowledge pertaining to disaster reduction and prevention should be assessed, widely developed and improved technologically, to enhance the traditional capacities of developing countries to deal with natural or man-made disasters.

Outreach Process

Participants are invited to report on their continuing activities and findings and to share their experiences with IDRC Davos. Periodic progress reports and assessments will be made available on the conference website www.idrc.info. This information will also be introduced to the UN-ISDR system.

Acknowledgement

Participants expressed gratitude and high appreciation to the IDRC Davos 2006 organizing committee and the sponsors whose efforts have been instrumental in making the IDRC Davos 2006 a success.

Davos, October, 2006

IDRC Davos 2006
Declaration Committee

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III.d. REGENSBOURG DECLARATION

Regensburg Recommendation

"Earth, Wind, Water, Fire – Environmental Challenges to Urban World Heritage"
Organization of World Heritage Cities Northwest-European Regional Conference
September 16-18, 2008 in Regensburg, Germany

We, the participants of the conference, representatives of the Organization of World Heritage Cities in Northwest Europe,

emphasize the importance of safeguarding the world's cultural heritage for present and future generations,

highlight that climate change and environmental challenges like storms, fooding, fire, earthquakes, weathering, erosion and landslides pose one of the most important threats to World Heritage cities, especially given the more frequent extreme weather situations,

emphasize that the loss and deterioration of the built cultural heritage due to natural disasters and climate change affects all people,

recall that the safeguarding of the urban cultural heritage is the shared responsibility of citizens, local and regional authorities, national governments and international organisations,

take into account the following documents :

- UNESCO's Convention Concerning the Protection of the World Cultural and Natural Heritage of 1972 and the corresponding Operational Guidelines for the Implementation of the World Heritage Convention of 2008,
- the Council of Europe's Recommendation No. R (93)9 of the Committee of Ministers to Member States on the Protection of the Architectural Heritage against Natural Disasters of 1993,
- the International Committee of the Blue Shields Radenci Declaration on the Protection of Cultural Heritage in Emergencies and Exceptional Situations of 1998,
- the Puebla Declaration regarding Prevention and Protection Measures for World Heritage Cities in Case of Disaster adopted by the Organization of World Heritage Cities General Assembly in Puebla, Mexico in 2001,
- ICOMOS Kyoto Declaration on Protection of Cultural Properties, Historic Areas and their Settings from Loss in Disasters of 2005,
- UNESCO's Strategy for Reducing Risks from Disasters at World Heritage Properties of 2006,
- New Delhi Resolution on Impact of Climate Change on Cultural Heritage, adopted at the ICOMOS International Workshop on Impact of Climate Change on Cultural Heritage of May 2007,
- ICOMOS Recommendations from the Scientific Council Symposium Cultural Heritage and Global Climate Change of March 2008,
- the publication of the World Heritage Centre "Policy Document on the Impacts of Climate Change on World Heritage Properties" of 2008,

point out that in most cases the issue of natural hazards and urban heritage is not yet being

approached in an interdisciplinary way. We recommend that the integrated research and interdisciplinary dialogue in geo-scientific as well as in cultural and social sciences is fostered in the sense that different knowledge is brought together,

underscore that traditional preservation techniques and local knowledge are invaluable in the protection of urban heritage sites from environmental challenges.

We the participants of this conference call on:

(1) the UNESCO World Heritage Committee,

a. to encourage and increase dialogue on natural risks to cultural heritage and to develop proper strategies for risk prevention and management,
b. to address the potential danger of natural disasters which confront urban World Heritage sites in the Operational Guidelines for the Implementation of the World Heritage Convention,
c. to foster funding programmes for prevention, preparedness, response and recovery measures in urban World Heritage sites,
d. to capitalise on existing initiative and projects and to disseminate the results and information gained,
e. to encourage interdisciplinary research on environmental challenges to urban cultural heritage by establishing UNESCO chairs and UNESCO networks in that field,
f. to support international conferences dealing with climate change and natural hazards in relation to urban World Heritage sites,
g. to establish awareness-raising programmes and to bring the topic into focus through UNESCO publications and other sources of information,

(2) the official Bodies of the European Union,

a. to develop coherent policies on historic urban landscapes together with international expert bodies,
b. to support scientific research on environmental challenges to urban World Heritage,
c. to strengthen the role of urban World Heritage and its protection from natural risks through European Regional Development funding (ERDF),

(3) States Parties to the World Heritage Convention,

a. to assure proper funding and staff for scientific research and preventive measures in the field of natural risks to urban World Heritage on a national level and to make risk prevention a topic for national funding programmes,
b. to foster training and education for people concerned with the protection of urban World Heritage sites with regard to natural risks and preventive measures,
c. to develop applicable instruments and provide resources that allow a fast reaction to natural hazards threatening World Heritage cities, considering that the complexity of cause and effect is not only limited to the World Heritage cities themselves,

(4) the World Heritage cities,

a. to make risk preparedness and the impacts of climate change an integral part of the cities' management of the World Heritage area and to develop proper emergency plans,
b. to pursue an integrated management approach that brings together different disciplines and institutions concerned with the protection of urban cultural heritage,
c. not to decide to interfere in the surrounding of their World Heritage, before there is absolutely no doubt about the future effects of such actions on nature,
d. to participate in research on risk preparedness and the protection of urban heritage from environmental challenges,
e. to share information on best practices, knowledge and experience relating to environmental challenges with other World Heritage cities,

(5) the Organization of World Heritage Cities,

a. to disseminate relevant information on natural risks to World Heritage cities, including case studies, recommendations and conference papers online via URBO – the Organization of World Heritage Cities research hub,
b. to establish a thematic pool on the Organization of World Heritage Cities website as a place where experts in the field of environmental hazards will be listed as contacts,
c. to make the issue of natural risks to World Heritage cities a topic of the next OWHC World Congress,
d. to actively encourage the exchange of knowledge and information and the establishment of appropriate networks and partnership programmes,
e. to disseminate the present recommendation adopted by the participants of the conference in Regensburg online.

We, the participants of this conference, submit this recommendation to the General Secretariat of the OWHC to be brought to the attention of:

a. the authorities, departments, or bodies responsible for matters relating to urban World Heritage,
b. various organisations or institutions concerned with natural risks and environmental challenges,
c. their contacts within appropriate international organisations dealing with the protection of World Heritage cities.

III.e. OLYMPIA PROTOCOL

United Nations
Educational, Scientific and
Cultural Organization

World Heritage Convention

ΥΠΟΥΡΓΕΙΟ ΠΟΛΙΤΙΣΜΟΥ
HELLENIC MINISTRY OF CULTURE

STRENGTHENING DISASTER RISK REDUCTION AT WORLD HERITAGE PROPERTIES: THE OLYMPIA PROTOCOL FOR INTERNATIONAL COOPERATION

UNESCO WORLD HERITAGE CENTRE
2009

1. INTRODUCTION: WHAT IS THIS DOCUMENT AND HOW TO USE IT

This document is part of the outcome of a Workshop on Disaster Risk Management at World Heritage Properties, jointly organised in November 2008 at Olympia (Greece) by the Hellenic Ministry of Culture and the UNESCO World Heritage Centre, with a financial contribution from the UNESCO Goodwill Ambassador Mrs. Marianna Vardinoyannis.

During this workshop, which gathered experts and heritage site managers from various regions, participants discussed the scope and contents of a possible "Programme" for reducing disaster risks at World Heritage properties, which would assist States Parties to the 1972 Convention in translating into action the "Strategy for Reducing Risks from Disasters at World Heritage Properties" adopted by the World Heritage Committee in 2007[1]. The present document provides a summary of the discussions held at Olympia with regard to this possible Programme.

The participants in the Olympia Workshop recognised that a Programme for reducing disaster risks at World Heritage properties would have a considerable scope and require the joint effort of all the actors engaged in the implementation of the World Heritage Convention. Considering the difficulty of identifying resources for the entire Programme in one time, it was suggested that its implementation could proceed in steps, depending on the availability of funds and the interest of potential donors. It was not to be expected, thus, that this Programme be implemented within a given time frame as a standard project under a single, comprehensive funding, but rather that it may provide a framework under which separate, but related activities could be developed, funded and carried out. For this reason, the present Document makes reference to the "Olympia Protocol for International Cooperation", named after the venue of the above-mentioned Workshop, rather than to a Programme in the more traditional sense.

It is hoped, indeed, that States Parties would use this document as a general framework, or protocol, for developing cooperation among them – possibly through partnerships and twinning arrangements among World Heritage properties sharing similar disaster risks - in the area of disaster risk reduction at World Heritage properties. At the same time, States Parties and other potential donors are encouraged to provide support to enable the UNESCO World Heritage Centre and other partners to ensure the overall coordination of the initiative as well as the implementation of the proposed activities at global level, within the framework of the Strategy approved by the World Heritage Committee. Some activities foreseen under this Document have already been carried out and others may be implemented with funding through the International Assistance scheme under the World Heritage Fund, or with support from States Parties and other donors. The majority of them, however, are currently not funded. The more resources can be mobilised, the larger the scope of the initiative that will be implemented and the more World Heritage sites that will benefit from it.

The present document includes an initial chapter explaining the rationale for its establishment (i.e. why such a protocol is needed), an outline of its main objectives and a description of proposed activities. The latter include both initiatives that would need to be implemented by UNESCO, owing to their global scope, and actions (the majority) that could be carried out directly by States Parties, individually or, more appropriately, in the framework of twinning arrangements among World Heritage sites, as mentioned above. Both the global and individual activities would be framed within a single, coherent strategy, where each step contributes to the achievement of the broader aims of the Protocol.

[1] See Document WHC-07/31.COM/7.2, available online from: http://whc.unesco.org/archive/2007/whc07-31com-72e.doc

2. RATIONALE: WHY REDUCING DISASTER RISKS

World Heritage properties, as with all heritage properties, are exposed to natural and man-made disasters, which threaten their integrity and may compromise their values.

By disaster we mean here a sudden event whose impact exceeds the normal capacity of property managers, or of a community, to control its consequences. The loss or deterioration of these outstanding properties would negatively impact the national and local communities, both for their cultural importance as a source of identity and of information on the past, and for their socio-economic value. Experience, moreover, has demonstrated that the conservation of cultural heritage and the transmission of traditional technology, skills, and local knowledge systems, are not just important *per se*, i.e. for their intrinsic historic, artistic or scientific significance, but because they may contribute fundamentally to sustainable development, including the mitigation of disasters. Heritage-sensitive practices, in fact, can assist in significantly reducing the impact of disasters, before, during and after they have taken place. For instance, research in areas affected by seismic activities has shown that buildings constructed with traditional techniques have often proven to be very resilient to quakes, when well maintained, as compared with modern construction. Sustainable land-use practices for agricultural and forestlands act to prevent landslides and floods, which each year cause more casualties than earthquakes in many parts of the world.

Risks related to disasters within heritage sites are a function of their vulnerability to different potential hazards. The recent natural disasters in Bam, Iran, or in the Old Fort of Galle in Sri Lanka are high profile examples of the vulnerability of cultural heritage worldwide. Natural heritage can also be threatened, in exceptional circumstances, by natural disasters. Hazards, however, may be also man-made, such as fire, explosions etc. Accidental forest fires, conflicts, massive refugee movements, bursting of tailing pond dams as in Doñana, Spain, are certainly a concern to natural World Heritage sites. If natural disasters are difficult to prevent or control, hazards resulting from human activities can be avoided, and the vulnerability of heritage sites to both natural and man-made disasters can be reduced, thus lowering the overall risk threatening a property. Despite this, most World Heritage properties, particularly in developing areas of the world, do not have any established policy or plan for managing the risk associated with potential disasters. Existing national and local disaster preparedness mechanisms, moreover, usually do not take into account the significance of these sites and do not include heritage expertise in their operations. At the same time, traditional knowledge and sustainable practices that ensured a certain level of protection from the worst effects of natural hazards are being progressively abandoned. As a result, hundreds of sites are virtually defenceless with respect to potential hazards and consequent disasters. Strengthening disaster risk management for properties inscribed in the World Heritage List, therefore, is necessary to prevent and reduce damage from disasters and preserve their cultural and natural values, thus protecting an essential support for the social and economic well-being of their communities.

UNESCO and other partner institutions such as ICCROM, ICOMOS, IUCN and ICOM, have in the past years developed a number of initiatives aimed at strengthening the capacity of site managers to address disaster risk management for World Heritage cultural and natural properties. These drew from concerns originating after the Second World War and renewed in 1992 because of the high and visible incidence of disasters and armed conflict on television in the early 90s. They were part of a general movement from curative approaches to conservation to a concern for preventive approaches, and from managing interventions to managing sites. While the need to strengthen disaster risk management for World Heritage has been stressed in the past, governmental commitments have not yet followed. In particular, the *Kobe-Tokyo Declaration* of 1997 and the *Recommendations from the Kobe Thematic Session on Cultural Heritage Risk Management* in 2005 pinpointed the necessity for better integration of concern for risk in cultural heritage management, and recognition of the value of local and indigenous knowledge in disaster risk reduction. The *Davos*

Declaration, adopted in 2006 by the International Disaster Reduction Conference (IDRC), reiterated these principles[2].

3. Overall objectives and strategy for implementation

The overall objective of this Protocol is to provide a general framework for developing cooperation among States Parties in order to translate the *Strategy for Reducing Risks from Disasters at the World Heritage Properties* into concrete actions at the site level.

The Protocol is based on a combination of global and site-based activities complementing each other and contributing to its overall goal. Its main components are:

1. The establishment of a Clearing House on Disaster Risk reduction;

2. The organization of International Workshops to introduce the 2007 *Strategy for Disaster Risk reduction art World Heritage Properties* and the scope and contents of the present *Protocol for Cooperation*. These workshops should also facilitate the identification of pilot sites – and the establishment of twinning arrangements among them – for the implementation of the Protocol;

3. The development, mostly through partnerships or twinning arrangements, of disaster risk reduction strategies on pilot properties inscribed on the World Heritage List, selected among those more vulnerable to possible hazards in different regions of the world, and also using, as a methodological reference, the recently developed ˝World Heritage Resource Manual for Disaster Risk Reduction˝;

4. The organisation of International Workshops to review the progress made at different pilot sites, harmonise the approaches and share the lessons learnt. The experience resulting from these activities will be widely disseminated through publications regional meetings, on line communications, etc.;

5. The development of complementary capacity-building, educational and communication initiatives.

4. Activities and expected results

A detailed description of the proposed activities is provided here below, arranged according to the three most relevant strategic objectives of the World Heritage Convention, i.e. Conservation, Capacity-Building and Communication, taking into account that the strategic objective of “Community” – adopted by the Committee in 2007 - is integrated within each of these. Activities that could be implemented directly by the States Parties, for example in the framework of twinning arrangements, are marked with an asterisk.

Conservation

4.1 **Establishment of a Clearing House on Disaster Risk Reduction**

It is proposed to develop a Clearing House of resource materials on Disaster Risk Reduction – possibly at the World Heritage Centre or at ICCROM - including policy texts, guidance, case studies and illustrations, drawing also from submission by States Parties in the context of Nominations and the Periodic Reporting exercise. This would include information on existing initiatives and twinning arrangements between World Heritage

[2] The *Davos Declaration* is accessible online from:
http://www.idrc.info/userfiles/image/PDF_2006/IDRC_Davos_Declaration_2006.pdf

properties. ICOM will continue to collect and put at disposal resource material concerning principally the disaster risk reduction of movable heritage.

***Expected result**: Information and reference materials on disaster risk reduction for World Heritage are accessible to those concerned.*

4.2 International Workshops[3] to introduce the Protocol, to identify pilot sites and facilitate the establishment of twinning arrangements

These international workshops (as many as appropriate and feasible) would involve bringing key management personnel from selected sites together with disaster risk reduction experts for cultural and/or natural heritage, depending on the selected sites. The Protocol for International Cooperation and its strategy for implementation will be presented, and case studies reviewed. In selecting potential sites, attention will be paid to ensure diversity of typologies (including presence of movable heritage), of disaster risks – with consideration given to post-disaster areas and linkages with Climate Change - and of geographical regions, with priority given to properties exposed to multiple hazards.

***Expected results**: The objective and scope of the protocol for cooperation as well as a methodology for developing disaster risk reduction strategies for each site are introduced. Experiences on disaster risk reduction are shared among management personnel, while concrete twinning arrangements among partner World Heritage sites are developed; understanding of the "Strategy for Reducing Risks from Disasters at World Heritage Properties"(adopted by the World Heritage Committee in 2007) is increased.*

4.3* Workshops to build capacities of concerned stakeholders and launch the development of appropriate disaster risk reduction strategies at selected sites.

These workshops -to be organized once two or more World Heritage properties have decided to cooperate in the framework of a twinning arrangement- will involve key management personnel from each site, local and national-level authorities responsible for reducing disaster risks in each country concerned (i.e. civil defense officials) and international resource persons. A general introduction on Disaster Risk Reduction will be provided, based on the selected sites' case studies, and modalities for long-term cooperation will also be identified through the establishment of time-framed action plans. This would be the first step towards the development of appropriate disaster risk reduction strategies at the concerned World Heritage properties.

***Expected results**: Capacities among the key stakeholders are built, and a concrete time-framed plan of action is defined for the implementation of activities in the context of established cooperation agreements (e.g. twinning) among States Parties and other partners.*

4.4* Risk Assessment at selected pilot properties

An analysis and assessment of the risks threatening the selected pilot sites and the people living in them will be led by responsible site managers, in collaboration with local civil defence officials and in consultation with disaster risk experts, taking into account existing records of disasters, potential hazards and the vulnerability of the property. This assessment will also provide a complete understanding of existing policies and measures for reducing the impact of disasters (if any) on the World Heritage property, and opportunities for cooperation with other concerned institutions.

[3] The Olympia Workshop of November 2008 intended to achieve these objectives, as well as serving as an opportunity for the launching of the Programme and this Protocol for International Cooperation.

***Expected results**: Risks to the World Heritage property are defined, which will have to be reduced through appropriate identification of potential hazards and vulnerabilities of the site. Priorities for intervention are set up.*

4.5* Socio-economic analysis and research on traditional skills and local knowledge systems relevant to disaster risk reduction

This activity will enable the understanding of the opportunities and threats, resulting in particular from the interaction between the local communities and the selected World Heritage properties, with regard to the risks associated to disasters. Research will be carried out on traditional land-uses, skills, knowledge systems etc. whose continuation or revitalisation might be beneficial to strengthen the preparedness to disaster for the protection of the World Heritage property. Research on traditional knowledge related to movable heritage disaster risk management will also be carried out. At the same time, the study will take into consideration the social and economic feasibility of the integration of this traditional knowledge in the management of risks within the property, making suggestions for its adaptation to modern constraints and requirements.

***Expected result**: Essential information is provided for the establishment of consultations with the local community and valuable insights on its possible participation in the reduction of disaster risks in the context of the management of their World Heritage property.*

4.6* Inter-institutional Workshops on Disaster Risk Reduction at site level

At this stage of the Protocol for Cooperation, it is proposed to organise an Inter-institutional Workshop at each of the pilot-sites, including representatives from the heritage agency responsible for the protection of the property, and of all other institutions and agencies, both at national and local levels, concerned with disaster risk reduction. The workshop, moderated by an international resource person, will facilitate the exchange of information on perceived risks at the World Heritage property and existing policies and procedures to mitigate the impact of disasters. This will provide essential input for the integration of concern for disaster risks within Management Plans for the World Heritage property.

***Expected results**: An understanding of the respective needs, roles and capacities with respect to disaster risk reduction for the World Heritage property is shared among participating institutes, and possible weaknesses and the scope for better coordination and integration are identified.*

4.7* Seminars with local community

A Seminar with representatives from the local communities will be held at each selected property in order to sensitise them to the risks from disasters affecting the World Heritage site in or around which they live, and the possible impact of a hazard on their persons and well-being. The Seminar will present and discuss the results of the research (see points 4.4 and 4.5 above) and solicit a reaction from the local communities on its possible direct involvement in disaster risk reduction activities for the protection of the World Heritage property, and the appropriate ways of achieving this.

***Expected result**: A full understanding of the opportunities and constraints for the integration of local community concerns and capacities related to disaster risk reduction into the Management Plan for the World Heritage property are shared among local communities.*

4.8 Mid-term International Workshop to review progress of the activities and validate methodologies for developing an appropriate disaster risk management strategy at site level.

This international workshop, gathering representatives from the pilot sites where activities are being implemented, will enable the review of experiences and learning among the participating sites, and will compare proposals for finalising their respective risk-sensitive management plans.

***Expected results**: The approach and methodologies being developed within each site are confirmed or reoriented, best practices are shared, and the network among all participants in the initiative is strengthened.*

4.9* Development of disaster risk reduction strategies at selected World Heritage properties

When activities 4.1 to 4.7 are completed, Heritage Conservation Agencies, assisted by international resource persons, will develop the appropriate Disaster Risk Reduction Strategies for their properties, taking into account all the elements gathered throughout the Programme. These will be integrated on one hand into Management Plans for the properties, if existing, and into existing Disaster Preparedness, Response and Recovery Plans at national and local levels. They will include the identification of indicators for monitoring the effective management of disaster risks at the sites.

***Expected result**: conservation at selected World Heritage properties is strengthened through improved disaster risk reduction strategies.*

4.10* Follow up at Pilot Properties

A follow-up evaluation is suggested, at each pilot World Heritage property, to assess the impact of the activities carried out on the conservation and management of the sites. This evaluation could take place two years after the completion of activity 4.9 above.

***Expected results**: lessons from past activities are learnt and corrective measures identified.*

Capacity building and Communication

4.11 Publications and dissemination of materials on the web

After the completion of the work at the selected pilot sites, a publication will be prepared, and translated into the official languages of UNESCO. Complementing the “Resource Manual” developed by ICCROM, IUCN and the World Heritage Centre, this publication will provide concrete references and best practices showing how the methodology outlined in the Resource Manual can be applied in practice. The Resource Manual will be also made available on the web, possibly in a more user-friendly format.

***Expected result**: Publications and materials (including on the web-site of the World Heritage Centre) on disaster risk reduction are disseminated to site managers around the world.*

4.12 Distribution of information for each Region

Distribution of the results from the above activities will also take place in conjunction with scheduled regional meetings for each of the five geographic regions of the world, i.e. Africa; Arab States; Asia and the Pacific; Europe and North America; and Latin America and the Caribbean. The staff members of the Heritage Conservation Agencies for each pilot site will be asked to contribute to information sessions and presenting the above-mentioned publication, and to share their experience in helping completing the risk-sensitive Management Plan for their site in the context of their particular region. This component will complement the above publication in building capacities among the various regions of the world.

***Expected result**: Firsthand knowledge about the development of disaster risk reduction strategies from the pilot sites exchanged.*

4.13 Development of a curriculum for a Training Course on Disaster Risk Reduction

Building on the experience of the activities carried out, and on the methodology outlined in the "Resource Manual", it is suggested to develop a curriculum for a short (one or two weeks) course on World Heritage Disaster Risk Reduction, which could possibly become a regular feature of ICCROM's Training programmes. This Course could be offered in different regions of the world, in partnership with the various Category 2 Centres on World Heritage that are being established, using one of the pilot World Heritage properties taking part in the initiative as a case study.

***Expected result**: Progress is made towards the development of a much-needed training programme which would build capacity on reducing disaster risks among those responsible for the conservation of World Heritage properties.*

4.14 Development of a component on Disaster Risk Reduction within the World Heritage in Young Hands School Kit and activities

It is proposed to expand the current School Kit "World Heritage in Young Hands" by introducing a component on Disaster Risk Reduction. The related activities could envisage visits to sites exposed to disaster risks and activities to reduce underlying risk factors.

***Expected result**: Educational material is developed which would contribute to sensitising the young people to the threats posed by disasters to World Heritage properties and the urgent need to reduce the related risks.*

4.15 International Day of Disaster Risk Reduction at World Heritage Properties

It is proposed to celebrate the International Day of Disaster Risk Reduction at World Heritage Properties, in coordination with the existing International Day of Disaster Risk Reduction (early October, every year), to give visibility and raise awareness about this important issue. This annual event will also provide opportunities for conducting drills and educational activities, including exhibitions, at World Heritage properties.

***Expected results**: Awareness is raised at the local and global level on disaster risks that affect World Heritage properties and ways to reduce them. At the same time, preparedness for effective response is strengthened at site level.*

5. IMPLEMENTATION MODALITIES

If resources were made available, the activities under this Protocol for International Cooperation could be coordinated by the World Heritage Centre of UNESCO, possibly through the establishment of a Focal Point, and implemented by various partners according to different modalities, including – as mentioned above – bilateral twinning arrangements.

Global activities such as International Workshops, publications and training courses will be implemented directly by the World Heritage Centre in collaboration with Advisory Bodies and other appropriate partners, including ICOM, the Blue Shield and the UN International Strategy for Disaster Reduction.

As already explained, considering the difficulty of identifying resources for all activities proposed under this protocol for Cooperation, it is envisaged that its implementation could proceed by steps, depending on the availability of funds and the interest of potential donors. The activities described in Section 4 above, on the other hand, lend themselves to a certain degree of flexibility. Site-based activities, for example, could be implemented independently

from global ones in the framework of specific “packages”, and the number of sites concerned would also depend on the availability of resources and the number of twinning arrangements established. When the Programme reaches a critical mass of ongoing activities, it is proposed to establish an Advisory/Steering Group involving, of course, the Advisory Bodies to the World Heritage Convention, but also UN-ISDR, ICOM and other Members of the Blue Shield, the Council of Europe and other relevant Institutions. The role of this Steering Group would be to review the progress of the Programme and provide orientation for its improvement.

IV LIST OF WEB LINKS

African Centre for Disaster Studies
http://acds.co.za/

AIC - American Institute for Conservation of Historic and Artist Works
http://aic.stanford.edu/disaster/

AIC - American Institute for Conservation of Historic and Artist Works, Disaster Recovery Page
http://aic.stanford.edu/library/online/disaster/
http://aic.stanford.edu/library/online/index.html

AIC - American Institute for Conservation of Historic and Artist Works (The Emergency Preparedness Response, And Recovery Committee)
http://aic.stanford.edu/committee/committees_taskforces/emergency/

American Institute for Conservation, Conservator form
http://www.aic-faic.org/guide/form.html

American Library Association
http://www.ala.org/ala/alalibrary/libraryfactsheet/alalibraryfactsheet10.htm
http://www.ala.org/ala/lita/litaevents/litaannual2003/disasterrecovery.htm
http://www.ala.org/ala/pla/plapubs/technotes/disasterplanning.htm
http://www.ala.org/ala/acrl/acrlpubs/crlnews/backissues2002/novmonth/crisisdisaster.htm

American Museum of Natural History, Museum SOS site
http://museum-sos.org

American Red Cross Disaster Service
http://www.redcross.org/
http://redcross.org/services/disaster/
http://www.arc-monroe.org/disaster/disaster.html
http://www.redcross.org/museum/

Amigos Library Services
http://www.amigos.org/
http:// www.amigos.org/preservation/disasterplan.pdf
http://www.amigos.org/preservation/bibdis.html

Archives Association British Columbia
http://aabc.bc.ca/aabc/newsletter/13_2/city_of_surrey_archives_and_surr.htm
http://aabc.bc.ca

Asian Disaster Reduction Center
http://www.adrc.org.jp/top.asp

Asian Disaster Preparedness Centre
http://www.adpc.net/
http://www.adpc.net/general/regional.html

Association for Preservation Technology International
http://www.apti.org/

Australasian Disaster and Hazard Research Directory
http://es.mq.edu.au/NHRC/ema.html

Australasian Institute of Risk Management
http://www.airm.or.au

Australian Emergency Management Forum
http://www.csu.edu.au/faculty/healt/aemf/links.html

Australian Emergency Management Institute
http://www.ema.go.au

Australian Museum Online
http://www.amonline.net.au/materials_conservation/projects/disaster/
http://www.amonline.net.au/materials_conservation/projects/disaster/preparation.htm

Belt Iberia SA
http://belt.es/sect_act/museos.htm

Benfield Hazard Research Centre
http://benfieldhrc.org/
http://www.benfieldhrc.org/SiteRoot/disaster_studies/index.html

Bevölkerungsschutz – Kulturgüterschutz (Federal Office for Civil Protection in Switzerland – Protection of Cultural Property)
http://www.bevoelkerungsschutz.admin.ch/internet/bs/de/home/themen/kgs.html

Blue Shield – ICBS International Committee of the Blue Shilde
http://www.ifla.org/blueshield.html
http://www.ifla.org/VI/4/admin/protect.htm

California State Archives
http://www.ss.ca.gov/archives/level3_disaster.html

Canadian Heritage Information Network
http://chin.gc.ca/English/index.html

Carnegie Museum of Natural History Library
http://www.carnegiemuseums.org/cmnh/library/disaster_response.htm

Causeanaffect
http://www.causeanaffect.org/

CBS – New Disaster Links
http://disasterlinks.net

CCEP – Canadian Centre for Emergency Preparedness
http://www.ccep.ca/
http://www.wcdm.org/

CCI – Canadian Conservation Institute
https://www.cci-icc.gc.ca/html
https://www.cci-icc.gc.ca/learning-opportunities/workshops/emerg_e.shtml

CCOHS – Canadian Centre for Occupational Health and Safety, Occupational Health and Safety page
http://www.cchos.ca/oshanswers

CDC – Centers for Disease Control and Prevention, Natural Disaster page
http://www.bt.cdc.gov/disasters

CDC – Centers for Disease Control and Prevention, Occupational Safety and Health page
http://www.cdc.gov/niosh/topics/chemical.html

CDM – Centre for Disaster Management
http://www.yashada.org/centre/cdm.htm

CENDIM - Centre for Disaster Management
http://www.cendim.boun.edu.tr/

Centre de Conservation du Québec
http://www.ccq.mcc.gouv.qc.ca/
http://www.ccq.mcc.gouv.qc.ca/publications/information.htm

Center for Disaster Management and Humanitarian Assistance
http://www.cdmha.org/initiatives/index.html

Center for Great Lakes Culture
http://www.greatlakes.msu.edu/

Center for the Study of Geological Risk
http://www.unige.ch/hazard/

Centro Universitario Europeo per i Beni Culturali
http://www.cuebc.amalficoast.it/
http://www.cuebc.amalficoast.it/16.htm

Colorado Preservation Alliance
http://www.colorado.gov/dpa/doit/archives/cpa/disaster/disasterresourcelist.htm

Conservation Centre for Art and Historic Artefacts
http://www.ccaha.org/
http://www.ccaha.org/disaster.html
http://www.ccaha.org/publications.html

COOL-Conservation on Line, Disaster Preparedness and Response page
http://palimpsest.stanford.edu/
http://palimpsest.stanford.edu/bytopic/disasters/plans

Conservation/Preservation Information for the General Public
http://palimpsest.stanford.edu/bytopic/genpub/

Council of Europe-Programme EUR-OPA
http://www.coe.int/T/E/Cultural_Co-operation/Disasters/

CPP – California Preservation Program
http://www.calpreservation.org/disaster/index.html

Cultural heritage without borders
http://www.chwb.org/

Detroit Institute of Arts, Michigan Alliance, Disaster and Conservation - Conservation Resource
http://www.dia.org/statewideservices/disaster1.html

Detroit Institute of Arts-Disaster Resource Center
http://www.dia.org/statewideservices/disaster1.html

Development gateway
http://www.developmentgateway.org

Directory for Disaster Reduction Institutions
http://www.unige.ch/idndr/

Disaster Center
http://www.disastercenter.com/

Disaster Information Network
http://www.disaster.net/

Disaster Mitigation Planning Assistance
http://disaster.lib.msu.edu/

Disaster Mitigation Planning Assistance Website
http://matrix.msu.edu/~disaster/

Disaster Planning Resource for Vermont's Cultural Institutions
http://www.vmga.org/DisasterPlanResources.html

Disaster Preparedness and Emergency Response Association
http://www.disater.org/dera/

Disaster Prevention Research Institute
http://www.dpri.kyoto-u.ac.jp/

Disaster Recovery Journal
http://www.drj.com

Disaster Recovery Resource List
http://www.archives.state.co.us/cpa/disaster/disasterresourcelist.html

Disaster Reduction and Human Renovation Institute-Disaster Reduction Museum
http://www.dri.ne.jp/html/e-in-tenji.html

Disaster Research Center
http://www.udel.edu/DRC/
http://www.udel.edu/DRC/drci.html

ECCO-European Confederation of Conservators Organisations
http://palimpsest.stanford.edu/byorg/ecco/library/ethics.html

ECHO-European Commission Humanitarian aid Office
http://europa.eu.int/comm/echo/index_en.htm

ECPFE-European Centre on Prevention and Forecasting of Earthquakes

Emergency If you're First…
http://aic.stanford.edu/disaster/emergncy.html

Emergency Management

Emergency Management Australia
http://www.ema.gov.au/

Emergency Preparedness Information Exchange
http://epix.azard.net

Emergency Response and Research Institute

European Centre on Urban Risks

AFEM-European Natural Disasters Training Centre

Extension Disaster Education Network
http://www.aces.uiuc.edu/~eden/index.html

FEMA – Federal Emergency Management Agency
http://www.fema.gov/ehp/milton.shtm

FEMA's Environmental and Historic Preservation and Cultural Resources Program

http://fema.gov/ehp/toolkit.shtm

GCI-Getty Conservation Institute
http://www.getty.edu/
http://www.getty.edu/conservation/public_programs/conferences/emergency.html
http://www.getty.edu/conservation/education/disaster.html

Geidai-International University of Fine Arts and Music
http://www.geidai.ac.jp/english/index.html

Georgia Department of Archives, Preservation Services
http://www.sos.state.ga.us/archives/ps/gps.htm

Georgia Department of Archives, Disaster Preparedness
http://www.sos.state.ga.us/archives/ps/disaster.htm

Global Museum - Disaster Preparedness
http://www4.wave.co.nz/~jollyroger/disasters/disasters.html

Global Disaster Information Network

Harvard University Library Preservation
http://preserve.harvard.edu/emergencies/index.html

Hazard Information Foundation

Heritage Preservation-The Heritage Emergency National Task Force
http://www.heritagepreservation.org/PROGRAMS/TASKFER.HTM

Horizon Institute-Independent Security Consultant
http://www.stevekeller.com/steve/pdf_files/SecurityMgt/DisasterPlanElements.pdf

ICCROM-International centre for conservation and restoration of cultural property
http://www.iccrom.org

ICOM - International Council of Museums
http://icom.museum/disaster_preparedness.html

ICOM - International Council of Museums, Disaster Relief page
http://icom.museum/disaster_relief

ICOMOS - International Council on Monuments and Sites
http://www.icomos.org
http://www.international.icomos.org/risk/risk2000.htm
http://www.international.icomos.org/risk/2001/ifla2001.htm

IFLA-International Federation of Library Associations

IFLA/PAC Core Activity on Preservation and Conservation
http://www.ifla.org/
http://www.ifla.org/VI/4/admin/emergcy.htm
http://www.ifla.org/VII:s19/usefullinks.htm

IHRC – International Hurricane Research Centre
http://ihrc.fiu.edu/index.htm

Inland Empire Libraries Disaster Response Network (IELDRN)
http://www.ieldrn.org/

International Committee of the Red Cross
http://www.icrc.org

International Hurricane Center
http://www.ihc.fiu.edu/index_ihc.htm

ISDR – International Strategy for Disaster Reduction
http://www.unisdr.org/

Istituto Centrale per il Restauro
http://www.icr.beniculturali.it/rischio/rischio00e.htm

Library Preservation Harvard University
http://preserve.harvard.edu/resources/disaster/index.html

LOC-Library of Congress, Preservation Directorate
http://www.loc.gov/preserv/emerg/dry.html

Lower Hudson Conference, Emergency Planning and Recovery Techniques
http://lowerhudsonconference.org/empart

Michigan Alliance for the Conservation of Cultural Heritage
http://www.dia.org/museum_info/statewide_services/disaster.asp

Midwest Art Conservation Center
http://www.preserveart.org/emergency.html

MHS - Minnesota Historical Society
http://mnhs/preserve/conservation/emergency.html

Museum Security Network
http://www.museum-security.org/
http://www.museum-security.org/indexdefinitief.html

Museumstuff
http://www.museumstuff.com/professionals/disaster_preparedness

NARA - National Archives and Records Administration, Preservation
http://www.archives.gov/preservation/index.html

NFPA - National Fire Protection Agency
http://www.nfpa.org

NARA, Records Management
http://www.archives.gov/records_management/index.html
http://archives.gov/records-mgmt/vital-record

National Archives and Records Administration
http://www.archives.gov/preservation/spanish_primer_disaster_preparedness.html

Natural Hazards Center, University of Colorado
http://www.colorado.edu/hazards

Natural Hazard Mitigation Group
http://www.unige.ch/hazards/

Natural Hazards Research Center
http://www.es.mq.edu.au/NHRC/web/front/homepagetables.htm

National Hurricane Center, part of the US's National Weather Service

National Research Institute for Earth Science and Disaster Prevention
http://www.bosai.go.jp/ad/Eng/index.html

Naval Pacific Meteorology and Oceanography Center - Joint Typhoon Warning Center

New York University, Disaster Plan Workbook
http://library.nyu.edu/preservation/disaster/begin.htm

NEDCC - Northeast Document Conservation Center (Disaster Assistance)
http://www.nedcc.org/welcome/disaster.htm
http://palimpsest.stanford.edu/bytopic/disasters

NIDR - National Institute of Disaster Restoration (a division of ASCR International)
http://www.ascr.org/institutes/nidr/

NPS – National Park Service, Heritage Preservation Service
http://www.cr.nps.gov/hps/

NSCC – Northern States Conservation Center, Emergency Preparedness Page
http://www.collectioncare.org/cci/cciep.html

NTHP – National Trust for Historic Preservation
http://www.nthp.org

Occupational Hazards Magazine
http://www.occupationalhazards.com

Office of Critical Infrastructure Protection and Emergency Preparedness
http://www.ociepep.gc.ca/home/index_e.asp

Pacific Disaster Center

Pacifi Tsunami Museum

PAHO – Pan American Health Organisation
http://www.paho.org/default.htm

Patrimoine sas frontières
http://www.patrimsf.org/

Primer on Disaster Preparedness, Management and Response : Paper-Based Materials
http://palipsest.staford.edu/bytopic/disaster/primer/

Prince Claus Fund
http://www.princeclausfund.nl/source_eng/news/index_2003_irak.html

Provincial Emergency Program, British Columbia
http://www.pep.bc.ca/

Public Safety and Emergency Preparedness

RAP-Regional Alliance for Preservation
http://www.rap-arcc.org
http://www.rap-arcc.org/leaflets/tccart.htm

Records and Information Management Resource List
http://infomgmt.homestead.com/files/websites.htm

Regional Disaster Information Center
http://www.crid.or.cr/crid/index.htm

Risk.net

Sociedad Argentina de Información
http://www.rap-arcc.org
http://www.rap-arcc.org/leaflets/tccart.htm

SOLINET - South-eastern Library Network Preservation Service
http://www.solinet.net/preservation/

South Carolina Archives and History Center, Services to State and Local Governments
http://www.state.sc.us/scdah/statelcl.htm

Sultana Disaster Online Museums and Archives
http://www.sultanadisaster.com/

The Escuminac Disaster Web Site-Online Museum
http://cap.ic.gc.ca/nb/hardwicke/escdismus/

Tornado - From Wikipedia, the free encyclopedia

Tsunami Hazard Mitigation - University of Washington

Tsunami FAQ - North Carolina Museum of National Science

Tsunami hazard mitigation and information - Disaster Center

UNESCO-United Nations Educational, Scientific and Cultural Organisation
http://www.unesco.org
http://www.unesco.org/webworld/archives/sro_citra/
http://www.unesco.org/webworld/portal_archives/pages/Preservation_and_Conservation/Disaster_Preparedness_and_Recovery/index.shtml
http://www.unesco.org/science/earthsciences/disaster/disasteractivitiespresent.htm
http://whc.unesco.org/pg.cfm?cid=82
http://whc.unesco.org/pg.cfm?cid=82&id_news=103

United Nations International Strategy for Disaster Reduction
http://www.unisdr.org

United Nations Office for the Coordination of Humanitarian Affairs - Relief Web
http://www.reliefweb.int/rw/dbc.nsf/doc100?OpenForm

University of Minnesota-Environmental Health and Safety
http://www.dehs.umn.edu/
http://www.dehs.umn.edu/newsletter/spring1999/story5.html

WAAC – Western Association for Art Conservation
http://palimpsest.stanford.edu/waac/

13th World Conference on Disaster Management
http://www.wcdm.org/

What is a Tsunami - University of Washington

World Meteorological Organization - Tropical Cyclone Programme (TCP)

V LIST OF TRAINING

Australia

- WORKSHOP, 2003
Title: **Workshop on Risk Management**
From: 26th of May 2003 To: 27th of May 2003
Place: City: Brisbane and Sydney
www: http://www.caval.edu.au
Organiser: CAVAL
Contact person: Eve Cornish
E-mail contact: evec@caval.edu.au
Address: CAVAL Collaborative Solutions 4 Park Drive Bundoora, Vic. 3038 Tel: + 61 3 9459 2722 Fax: +61 3 9459 2733
Description: The purpose of this workshop is an examination of risk analysis, mitigation and the application of the Australian/New Zealand standard and other tolls, particularly in relation to libraries and other organisations whose services depend in part on collections.

- WORKSHOP, 2001
Title: **Workshop on Disaster Management and Recovery**
From: 15th of November 2001 To: 16th of November 2001
Place: CAVAL, Caval Archive and Research Materials (CARM)
City: Bundoora
www: http://www.caval.edu.au
Organiser: CAVAL
Contact person: Eve Cornish
E-mail contact: evec@caval.edu.au
Address: CAVAL Collaborative Solutions 4 Park Drive Bundoora, Vic. 3038 Tel: + 61 3 9459 2722 Fax: +61 3 9459 2733
Description: This workshop features practical simulated library and archive disasters. Participants visited a disaster site, retrieve disaster struck library and archive materials and equipment, decide what action should be taken, set up an air drying process, learn how to compile a disaster response manual and how to manage disaster recovery effectively.

Brunei

- WORKSHOP, 1998
Title: **Emergency Planning and Disaster Management for ASEAN Museums and Heritage Institutions**
From: 6th of December 1998 To: 11th of December 1998
Place: City: Bandar Seri Begawan
Organiser: Association of Southeast Asian Nations (ASEAN)
www: http://www.aseansec.org
Contact person: Bantong Antaran
E-mail: bmddir@brunet.bn
Address: Ministry of Foreign Affairs Jalan Subock Bandar Seri Begawan Tel: + 673 2 22 37 27 Fax: +673 2 24 27 27
Description: This workshop discussed the types of emergencies and disaster problems that librarians and museums might encounter. It particularly aimed to equip the participants in the fundamental principles of emergency planning, formulation, implementation and established

the broad principle of emergency planning in museums heritage institutions in the ASEAN members countries.

Canada

- WORKSHOP, 2006
Title: Assessing and Managing Risks to Your Collections at the 66th Annual Meeting of the Society of Vertebrate Palaeontology Ottawa
Date: 22 October 2006
Place: Canadian Museum of Nature
City: Ottawa
www: http://www.vertpaleo.org/meetings/meeting_06/reg.htm
Organiser: Canadian Museum of Nature
Contact person: Robert Waller
E-mail contact: rwaller@mus-nature.ca
Address:
Canadian Museum of Nature
PO Box 3443, Station D
Ottawa ON K1P 6P4
Tel. +1 613-566-4797 - **Fax** +1 613-364-4027
Description: The Canadian Museum of Nature is hosting the 66th Annual Meeting of the Society of Vertebrate Palaeontology October 18-22, 2006 in Ottawa. In association with this conference, on Sunday October 22, 2006 the one day workshop Assessing Risks to Your Collections will be offered. The objective of this non-technical workshop is to demonstrate to participants a method of assessing risks to collections that has been developed and implemented at the Canadian Museum of Nature. This workshop was designed and developed by conservators and collection managers for organizations and individuals interested in a global framework to determine their preventive conservation priorities and to learn how this can help them to invest their limited funds in a cost-effective manner. Participants are provided with various learning tools including the workshop manual, exercises, references and a glossary of terms.

- ICCROM COURSE, 2006
Title: Reducing Risks to Collections Course
From: 16 October 2006 **To:** 27 October 2006
Place: Canadian Conservation Institute
City: Ottawa
www:
http://www.iccrom.org/eng/01train_en/announce_en/2006_10risks_en.shtml
Organiser: ICCROM (International Centre for the Study of the Preservation and Restoration of Cultural Property) and CCI (Canadian Conservation Institute)
Contact person: Julie Murtagh
E-mail contact: julie.murtagh@pch.gc.ca
Address:
Learning and Development Officer
Canadian Conservation Institute
1030 Innes Rd, Ottawa ON, K1A OM5
Tel. +1 613 998 3721 - **Fax** +1 613 998 4721
Address:

ICCROM
13, via di San Michele
I-00153 Roma
Tel +39 06 585531 - **Fax** +39 06 58553349
Description: The purpose of the course is to discuss and practice the risk management approach to the management of cultural property. Risk management can be understood as not only the management of rare catastrophes, but also the management of slow continual hazards, and everything in between. At the core of risk management is the concept of "loss of value," which depends on the concept of the value of the collections. Thus risk management becomes an integrated institutional view of both the use and the conservation of cultural property. It provides a reliable tool to establish priorities and design strategies. The course focuses on the principles of risk management in the field of cultural property, and reviews current interpretations and applications. It examines the best available research to enhance estimates of risk. Participants practice the systematic stages of risk management in teams, from risk assessment of a real museum or archive collection, to development of options for risk mitigation. The course emphasizes risk communication, and participants will have various opportunities to exercise this skill.

- CONFERENCE and WORKSHOP, 2006
Title: 32nd Annual CAC Conference and Workshop on Risk Management for Cultural Institutions and Collections
From: 15 May 2006 **To:** 19 May 2006
Place: St. Michael's College
City: Toronto, Ontario
www: www.cac-accr.ca
Organiser: Canadian Association for Conservation/Association canadienne pour la conservation et la restauration (CAC/ACCR)
E-mail contact: coordinator@cac-accr.com
Address:
CAC
P.O. Box 87028, 322 Bank Street
Ottawa, ON, K2P 1X0
Tel. +1 613 231 3977 - **Fax** +1 613 231 4406
Description: This year's workshop theme is Risk Management. Workshop: This two-day workshop will provide a forum where museum professionals, conservators and educators can share ideas and learn about Risk Management. Workshop content will be delivered as case studies, group-discussions and panel presentations. Experienced lecturers will coordinate workshops and participate in general discussions. A workshop reception will be held on Sunday evening, May 14, 2006 at the Bata Shoe Museum.

Germany

- WORKSHOP 2007
Title: From passive conservation to risk management: Experiences with and recent concepts on preventive conservation
Date: 1 of March 2007
Organiser: University of Applied Sciences Berlin (FHTW-Berlin), Class on Conservation and Restoration and the Restorers Association of Germany (Verband der Restauratoren, VDR)
Contact person: Alexandra Jeberien
Email contact: a.jeberien@berlin__d, jeberien@fhtw-berlin__de

Address: Wilhelminenhofstrasse 76/77, 12459 Berlin, Germany
Tel: +49 30 5019 4607
Website: URL:http://www.fhtw-berlin.de/Forschung/Projekte/Forschungsassistenzen/Conservation/index.html

Japan

- WORKSHOP, 2004
Title: **Disaster Mitigation of Urban Cultural Heritage**
From: 23rd of March 2004
Place: Ritsumeikan University
City: Kyoto
www: http://www.ritsumei.ac.jp/se/rv/coe/information-e.html
Organiser: Ritsumeikan University
Contact person: Prof. Masatake Murahashi and Prof. Akihisa Yoshikoshi
E-mail contact: rka23018@se.ritsumei.ac.jp
Address: Office of Civil and Environmental Engineering Ritsumeikan University 1-1-1 Noji-Higashi, Kusatsu Shiga 525-8577 JAPAN Tel: + 81 77 561 2739 Fax: +81 77 561 2667
Description: Within the framework of the laugh of the Research Centre for Urban Cultural Disaster Mitigation based in Kyoto, a workshop is organised and focused on risk preparedness for cultural heritage and regarding planning activities for protecting this heritage from natural disasters in Japan.

- TRAINING COURSE, 2006
Title: International Training Course on Risk Disaster Risk Management of Cultural Heritage 2006
From: 22 October 2006 **To:** 4 November 2006
Place: Ritsumeikan University - Research Center for Disaster Mitigation for Urban Cultural Heritage (Rits-DMUCH)
City: Kyoto
www: http://www.rits-coe.jp/dmuch/it2006.html
Organiser: Rits-DMUCH in cooperation with UNESCO World Heritage Centre, ICCROM and ICOMOS
Contact person: Dr. Kanefusa Masuda
E-mail contact: pfe02120@nifty.ne.jp
Address:
Rits-DMUCH
58, Komatsubara-Kita-Machi, Kita-Ku
Kyoto 603-8341
Tel. (Japan): 075-467-8237; **Tel.** (International): +81-75-467-8237
Description: This first course will provide a forum for heritage and disaster-prevention experts to meet, discuss and learn how to make a cultural heritage risk management strategy an integral part of a comprehensive risk management plan. The training course is a follow-up action to the recommendations adopted at the Special Thematic Session on Risk Management for Cultural Heritage held at UN-WCDR (World Conference on Disaster Reduction) in January 2005 in Kobe, Hyogo (Japan) and which was reinforced at the 30th Session of the World Heritage Committee in July 2006 (Vilnius, Lithuania). The objective of the countries is to provide an overview of various facets of disaster risk management of cultural heritage. The course provides interdisciplinary training for professionals to: better understand an integrated risk assessment to analyze vulnerability of cultural heritage to physical, socioeconomic and

political risk; build integrated system for disaster risk management of cultural heritage, incorporating disaster preparedness and urban planning; formulate risk management plan for cultural heritage that corresponds to the regional disaster mitigation plan; and establish an international scientific network system for risk management of cultural heritage. The course is comprised of lectures, field trips, group work, discussion, and presentation. Participants are expected to actively participate in the course contents. It is our expectation that the course will promote the development of collaborations and networking among scholars and expertise in cultural heritage protection.

Jordan

- WORKSHOP, 2005
Title: Euromed Heritage workshop (1st) on Cultural heritage management in times of armed conflict
From: 14 April 2005 **To:** 17 April 2005
City: Amman
www: http://www.euromedheritage.net
http://www.euromedheritage.net/en/rmsu/rmsu_workshops/amman.htm
Organiser: Europe Aid; Regional Management and Support Unit (RMSU)
Contact Person: Monica Robello
E-mail contact: Monica.robelo@euromedheritage.net
Address:
Regional Management Support Unit
ICCD Istituto Centrale per il Catalogo e la Documentazione
Via di San Michele, 18
Roma 00153
Tel. +39 06 58332194 – Fax +39 06 58179396
Description: The expected results from the workshop are: To assess success and failure in cultural heritage protection under the perspective set by the Hague Conventions; To present study cases for cultural heritage protection in the worse case scenario in times of armed conflict; To identify the requirements for the assignment of cultural heritage experts in areas of conflict based on the EC / UN experience; To promote awareness both locally and internationally on the need for ratification of the 2nd protocol of the Hague Convention; To help to promote locally the enforcement of the Hague Convention and all the related rules in each country member of the Euromed Heritage network. The results of the Workshop will be widely disseminated especially among the Euromed Heritage broader community to secure follow up at both national and international level.

Mexico

- INTERNATIONAL COURSE, 2003
Title: **International course on Protección del Patrimonio Cultural en Caso de Desastres**
From: 12th of May 2003 To: 18th of May 2003
Place: Hotel Los Aluxes
City: Mérida (Yucatán)
www: http://transparencia.inah.gob.mx/directorio.php
Organiser: Instituto Nacional de Antropología e Historia
Contact person: Vicente Flores Arias
E-mail contact: coordinacion.cnmh@inah.gob.mx

Address: INAH Coordinación Nacional de Monumentos Históricos Correo Mayor No.11, Col. Centro CUAUHTEMOC/Districto Federal, CP 06060 Tel: +52 55 42 56 31 Fax: +52 55 42 56 63
Description: The main purpose was to discuss about preparedness and response strategies in order to deal with natural disasters such as flooding, volcano irruption, hurricane. The final objective was to reach a global method regarding civil prevention and emergency plans through case studies and visits. Within this framework, several institutions around Latin America were invited to explain their local experiences.

Nepal

- REGIONAL WORKSHOP, 2006
Title: Disaster Preparedness Plans for natural hazards
From: 7 August 2006 **To:** 9 August 2006
City: Kathmandu
www: http://www.icimod.org/home/news/news.content.php?nid=35
Organiser: International Centre for Integrated Mountain Development (ICIMOD)
Contact Person: Mats Eriksson
E-mail contact: meriksson@icimod.org.np
Address:
ICIMOD
International Centre for Integrated Mountain Development
Water, Hazards and Environmental Management
Box 3226, Kathmandu
Tel: +977 1 5525313
Description: Experts from Bangladesh, India, Nepal and Pakistan, representing government, non-government organisations, and community-based and private organisations, meet in Kathmandu 7-9 August, to discuss the status of disaster preparedness plans in the four countries. Attempts will be to identify gaps and shortcomings in policies and implementation of disaster preparedness plans. The workshop will also develop a forum for sharing experiences, exchanging information, and holding discussions related to drafting disaster preparedness plans. The workshop is financed by the European Commission Humanitarian Aid Department (DG ECHO), under the project 'Living with Risks – Sharing Knowledge on Disaster Preparedness in the Himalayan Region'. The project supports key practitioners with current knowledge in the field of disaster preparedness, mainly in relation to floods, landslides and earthquakes; and builds capacity in multi hazard risk assessment, as well as in providing a platform for interaction and exchange of experiences.

Netherlands (the)

- INTERNATIONAL SYMPOSIUM, 2005
Title: The First International Symposium on Geo-information for Disaster Management
From: 21 March 2005 **To:** 23 March 2005
Place: Delft University of Technology, Aula Conference
City: Delft, The Netherlands
www: http://www.gdmc.nl/events/gi4dm/home.htm
Organiser: Geo-Database Management Center (GDMC)
Contact person: Elfriede Fendel
E-mail contact: GDMC@geo.tudelft.nl
Address:

GDMC
Visitor's address: Jaffalaan 9, 2628 BX Delft, The Netherlands
Mailing address: P.O. Box 5030, 2600 GA Delft, The Netherlands
Tel. +31 15 2784548
Description: The Symposium will focus primarily on the response and secondarily on the relief phase of Disaster Management encouraging a wide discussion on systems and requirements for use of geo-information under time and stress constraints and unfamiliar situations, environments and circumstances. Objectives: to establish the state-of-the-art in Disaster Management; to review tools, software, existing geo-information sources, organizational structures and methods for work in crisis situations; to outline drawbacks in current use, discovery, integration and exchange of geo-information; to make suggestions for future research directions.

Spain

- DISTANCE LEARNING COURSE, 2002
Title: **Prevención de Riesgos en la Intervención del Patrimonio**
From: 25th of April 2002 To: 24th of May 2002
Place: Instituto Andaluz del Patrimonio Histórico
City: Seville
www: http://www.juntadeandalucia.es/cultura/iaph/
Organiser: Instituto Andaluz del Patrimonio Histórico
Contact person: Antonio López Román
E-mail contact: cursos.iaph.ccul@juntadeandalucia.es
Address: Instituto Andaluz del Patrimonio Histórico Departamento de Formación y Comunicación Isala de la Cartuja, 41092 Sevilla Tel: + 34 955 037 047 Fax: +34 955 037 001
Description: This one-month course used new technology (Internet) to train professional from cultural institutions which may concern by risk management impacts. This e-learning course focused on emergency management, legislation, dangerous substances ordering, security information network, control, physic and biologic risks, fire, residues management, security and hygiene.

Poland

- INTERNATIONAL WORKSHOP, 2001
Title: Protection of cultural heritage from special threats
From: 14 May 2001 **To:** 16 May 2001
City: Cracow
www: http://www.mk.gov.pl/pknbt/en/polska06.php
Organiser: Polish Committee of The Blue Shield (International organizations were represented by UNESCO, ICOMOS, INTERPOL and NATO)
Contact Person: Dariusz Drewniacki
E-mail contact: ddrewniacki@mk.gov.pl
Address:
Dariusz Drewniacki
The Ministry of Culture
Bureau of Defence Matters
15/17 Krakowskie Przedmieście St.
00-071 Warsaw
Tel. +48 22 828 16 96

Description: The International Workshop was held in Cracow on May 14 –16, 2001 on the initiative of Polish Advisory Committee for Protection of Cultural Heritage in case of armed conflict. The objectives of the workshop were: to analyze experiences in counteracting threats to cultural heritage, to try to integrate activities of various public services and to develop a common strategy of Eastern and Central European countries for protection of cultural heritage in case of extraordinary threats. Following the plenary sessions, discussions in working groups and practical exercises, the participants of the International Workshop have indicated the benefits from the trial of integrated approach of various services in counteracting threats to cultural heritage as well as from exchange of experiences in this area. The participants of the Workshop also confirm that a Training Centre for Specialists on cultural heritage protection for Eastern and Central European Countries should serve to accomplish the above-mentioned goal.

Romania

- ICCROM COURSE, 2007
Title: Reducing Risks to Collections Course
From: 18 June 2007 **To:** 6 July 2007
City: Sibiu
www: http://www.iccrom.org/eng/01train_en/announce_en/2007_06risksROM
Organiser: ICCROM, Ministry of Culture and Religious Affairs Romania, National Museum Complex ASTRA, CCI (Canadian Conservation Institute) and ICN (Netherlands Institute for Cultural Heritage)
E-mail contact: collections@iccrom.org
Address:
PC 07 - Collections Unit
ICCROM
13, via di San Michele
I-00153 Roma
Tel +39 06 585531 - Fax +39 06 58553349
Description: The purpose of this course is to focus on the risk management approach to preventive conservation of collections. Risks can be not only due to rare and catastrophic events, such as fire or flood, but also to continual hazards, such as incorrect relative humidity or lighting, and to everything in between. Risk management is an integrated view of all expected damages and losses to collections and provides a reliable tool to establish priorities and design strategies. The course will review the risk concept in general, and its current interpretations and applications in the field of cultural heritage. It will examine the best available research for estimating all types of risks. Participants will practice each stage of this approach in teams, from the risk assessment of a real museum or archive collection, to the development of options for risk mitigation. This course will especially consider the concerns of institutions with limited resources. It will emphasize risk communication and give participants various opportunities to exercise this skill.

United Kingdom

- SEMINAR, 2000
Titre: **Disaster Management**
From: 23rd of May 2000
Place: Conference Centre, British Library
City: London

www: http://www.bl.uk/services/conference.html
Organiser: The British Library
Contact person: Belinda Sanderson
E-mail: belinda.sanderson@bl.uk
Address: National Preservation Office The British Library 96 Euston Road London NW1 2DB Tel: +44 20 74 12 77 24 Fax: + 44 20 74 12 77 96
Description: The aim of this seminar is to look at different ways of approaching disaster management, focusing on co-operative and cross-sectored management of resources. Increasingly, institutions are planning in collaboration, whether regionally, nationally or internationally. These programmes are supported by a wealth of shared information which is frequently web based.

- WORKSHOP, 2002
Title: **Workshop on Disaster Management**
From: 16th of May 2002
Place: University of Dundee
City: Dundee (Scotland)
Organiser: University of Dundee
Contact person: Helen Holden
E-mail contact: h.holden@dundee.ac.uk
Address: University of Dundee Library Conservation Unit Dundee DD1 4HN, Scotland
Tel/Fax: +44 13 82 34 40 94

- COURSE, 2003
Title: **Course on Disasters and Housekeeping: Surviving a Disaster**
From: 15th of December 2003 To: 17th of December 2003
Place: University of College London City: London
www: http://www.ucl.ac.uk/sustainableheritage/
Organiser: University London College
Contact person: Sophia Mouzouropoulos
E-mail contact: s.mouzouropoulos@ucl.ac.uk
Address: University of College London Centre for Sustainable Heritage Bartlett School of Graduate Studies Torrington Place Site Gower Street, London WC1E 6BT
Tel: + 44 20 679 5903
Description: This highly-rated course gives to applicants a comprehensive knowledge of housekeeping principles and their practical applications using the historic rooms and collections at an English heritage property. The main purposes of this course were to set up a salvage operation from scratch, rescue newly fire and water damaged collections in an environment created to be as realistic as possible and to maintain a disaster plan and to keep it relevant.

- COURSE, 2005-2006
Title: Safeguarding Heritage at Risk: Disaster Management in United Kingdom Museum, Libraries and Archives
From: March 2005 **To:** September 2006
Place: Liverpool Johon Moores University, Faculty of Business and Law, School of Business Information
City: Liverpool
www: http://www.ljmu.ac.uk/BSN/58823.htm http://www.ahrc.ac.uk/

Organiser: The Arts and Humanities Research Council (AHRC) and Liverpool Johon Moores University, Faculty of Business and Law, School of Business Information
Contact person: Yvonne Smith
E-mail contact: Y.M.Smith@livjm.ac.uk
Address:
Shool of Business Information
Liverpool John Moores University
John Foster Building, 98 Mount Pleasant
Liverpool L3 5UZ
Tel. +44 0151 231 3453
Description: A nineteen-month research fundedd and project by the Arts and Humanities Research Council (AHRC). The national cultural heritage in museums, archives and libraries is at risk from natural (e.g. flooding) and man-made (e.g. arson, armed conflict) 'disasters'. Past incidents show that these may destroy or damage collections and buildings, cause disruption to services and the loss of unique material forever. Effective disaster management can prevent or reduce the impact of such incidents. The project, undertaken in the School of Business Information aims to contribute to the development of effective disaster management that meets the needs of archives, libraries and museums in the 21st century.

- WORKSHOP 2007
Title: Assessing and Managing Risks to Your Collections
City: Birmingham, United Kingdom
From: 21 To: 22 March 2007
Contact person: Clare Hank
Email contact: clare.hanks@birmingham.gov.uk
Address: Birmingham Museum and Art Gallery
Tel: +44 121 303 1270
Description:
If you have responsibility for collections management, this workshop will provide an invaluable opportunity to implement a unique framework for identifying risks to collections and enable you to prioritise your collection care strategy effectively against other budgetary pressures.
Developed by the workshop leader, Dr Robert Waller of the Canadian Museum of Nature, the framework is utilised by museums globally and will empower you to understand and develop an effective and efficient approach to managing risks to your collections.

USA (the)

- FORUM, 2001
Title: **Risk Management and Assessments of Natural Hazards. Toward a Safer America: Building Natural Hazard Resistant Communities through Risk**
From: 5th of February 2001 To: 6th of February 2001
Place: Hotel Washington
City: Washington
Organiser: US Government
Description: The purpose of this forum was to assess the state of risk assessment and management for natural hazards. To do this Federal research, applications, services, implementations, and public outreach programmes were reviewed.

- WORKSHOP, 2001
Title: **Disaster Response: The Critical First 48 Hours**
From: August 9-10; August 13-14; August 16-17; August 20-21 and August 23-24, 2001
Place: Milwaukee Public Museum; Mount Rushmore; North Dakota Historical Society; Blanden Memorial Art Museum and Minnesota Historical Society
City: Milwaukee; Keystone; Bismarck; Fort Dodge and St. Paul
www: http://www.preserveart.org/wkshps/workshops.html
Organiser: Upper Midwest Conservation Association
Contact person: Melinda Markell
E-mail person: umca@aol.com
Address: Upper Midwest Conservation Association 2400 Third Avenue South Minneapolis, MN 5504 Tel: +1 612 870 3128/ + 1 612 870 3128 Fax: +1 612 870 3118
Description: This workshop covered all aspects of disaster response in the critical 48 hours after a disaster occurs. Topics covered include health and safety, insurance, working with FEMA, setting up a disaster response team, using a disaster preparedness plan, identifying local resources, establishing a disaster response equipment and material cache, documenting a disaster and recovery efforts, team building exercises including a practical disaster response scenario.

- WORKSHOP, 2002
Title: **Protection Library Collections: Emergency Preparedness, Response and Recovery**
From: 2nd, 7th 9th, 15th of May 2002 and 22nd of August 2002
Place: Foster Library; Sacramento Public Library; Shasta Public Library and Fresno County Library City: Ventura, Sacramento, Redding, Fresno
www: http://cpc.stanford.edu/about/index.html
Organiser: California Preservation Clearinghouse
Contact person: Julie A. Page
E-mail contact: jpage@ucsd.edu
Address: Preservation Department - Geisel Library University of California, San Diego 9500 Gilman Dr. 075N La Jolla, CA 92093-0175 Tel: +1 858 534 7695
Description: This course is divided into two parts. The first one covered "Planning and Response" and the second one "Recovery and Training" held in different places around California. The purposes of this series of workshops were: to write or update a library emergency plan; use practical decision-making skills during an emergency; conduct an assessment of the buildings; set post-disaster action priorities for the library; pack and air dry wet books, and deal with AV computer media and finally use a fire extinguisher.

- COURSE, 2002
Title: **Introduction to Health and Safety in Museums**
From: 9th of July 2002 To: 15th of August 2002
Place: GW University
City: Washington
www: http://www.gwu.edu
Organiser: GW University
Contact person: David Goldsmith
E-mail contact: eohdfg@gwumc.edu
Contact person: Catharine Hawks
E-mail contact: cahawks@aol.com
Address: TBA in Ross Hall George Washington University Campus 2121 Eye Street N.W Washington, D.C 20052 Tel/Fax: +1 703 876 9272

Description: The purposes of this course were: to describe the major health and safety issues in museums and related institutions relative to employees, volunteers and visitors; to identify major health and safety hazards that might be encountered in museum operations (exhibit preparation, collection management and care, research, and interpretative programming); to provide state of the art occupational safety and health management for museums; to provide an understanding of the pertinent regulations and the role of regulatory agencies in ensuring safety in museums; to identify procedures to improve public safety and staff emergency response in museums; to describe methods of controlling museum hazards and preventing occupational and environmental health effects, including occupational safety, fire prevention, electrical safety, machine guarding, local exhaust, ventilation, hazardous waste handling, and personal protection equipment.

- WORKSHOP, 2003
Title: **Disaster response: Salvaging Museum, Library, and Archival Materials**
From: 7th-8th August; 11th-12th August; 25th-26th August 2003 and 4th-5th September; 15th-16th September 2003
Place: State Historical Society of North Dakota; South Dakota Art Museum; Milwaukee Public Museum; Minneapolis Institute of Arts and University of Iowa City: Bismarck, Brookings, Milwaukee, Minnesota and Iowa city
www: http://www.preserveart.org/wkshps/workshops.html
Organiser: Upper Midwest Conservation Association
Contact person: Melinda Markell
E-mail contact: umca@aol.com
Address: Upper Midwest Conservation Association 2400 Third Avenue South Minneapolis MN 55404 Tel: + 1 612 870 3120 Fax: +1 612 870 3118
Description: This workshop intends to train participants to successfully and safely overcome disasters to their collections. It focuses on the salvage aspects of disaster response. Participants worked with objects representing different types of disasters and learnt the hand-on technique for proper salvage.

- DISTANCE LEARNING COURSE, 2004
Title: **Distance Learning Course on Distance Planning**
From: 18th of February 2004 (Follow up sessions on March 10 and March 31, 2004)
www: http://solinet.net
Organiser: SOLINET
Contact person: Vanessa Richardson
E-mail contact: vrichardson@solinet.net
Address: Solinet 1438 West Peachtree Street NW Suite 200, Atlanta Tel: +1 800 999 8558
Description: This class guides participants through the development of a written disaster plan. This web-based workshop is designed to support the work of an institution's disaster planning committee. The modules cover: establishment of a planning structure, information gathering, including risk assessment and resource list development, setting recovery priorities, an overview of recovery procedures, plan development and working with disaster recovery vendors.

- WORKSHOP, 2004
Title: **Disaster Mitigating for Cultural Collections**
From: 19th of April 2004 To: 21st of April 2004
Place: Museum of Modern Art
City: San Francisco

www: http://cpc.stanford.edu/about/events.html
http//www.ccaha.org
Organiser: Conservation Centre for Art and Historic Artefacts (CCAHA)
Contact person: Julie A. Page
E-mail contact: jpage@ucsd.edu and ccaha@ccaha.org
Address: Preservation Department - Geisel Library University of California, San Diego 9500 Gilman Dr. 075N La Jolla, CA 92093-0175 Tel: +1 858 534 7695 Fax: +1 215 735 9313
Description: Disaster planning prepares institutions to respond quickly to emergencies. Disaster mitigation, or the ability to identify risks and halt some emergencies from happening, should always play a key role in an institution's emergency preparedness and planning effort. In addition to large scale emergencies, institutions should also be aware of the danger to their collections from roof leaks, pest infestation, mod blooms, theft, and fire. This disaster mitigation workshop series will provide tools for assessing an institution's vulnerability to disaster; evaluating fire prevention, detection, and suppression strategies; determining security risks; and assessing health and safety factors related to disaster.

- WORKSHOP, 2004
Title: **Protecting Library Collections: Emergency Preparedness, Response and Recovery**
From:9th and 16th of March 2004; 4th and 11th May 2004
Place: Cerritos Public Library and Stanislaus County Library-Salida Branch
City: Los Angeles and Modesto
www: http://cpc.stanford.edu/about/events.html
Organiser: California Preservation Clearinghouse
Contact person: Pam Alger
E-mail contact: mclshq@mcls.org
Contact person: Darla Gunning
E-mail contact: djg.499@usa.net
Address: Tel: + 1 626 683 8244 and +1 209 937 8630 Fax:
Description: This course is the follow up to the 2002 workshop and is divided into two parts. The first one covered "Planning and Response" and the second one "Recovery and Training" held in different places around California. The purposes of this series of workshops were: to write or update a library emergency plan; use practical decision-making skills during an emergency; conduct an assessment of the buildings; set post-disaster action priorities for the library; pack and air dry wet books, and deal with AV computer media and finally work with emergency response service providers and the media.

- SEMINAR, 2004
Title: **Disaster Preparedness**
From: 15th of March 2004 To: 16th of March 2004
Place: The National Cowboy and Western Heritage Museum
City: Oklahoma city
www: http://www.okmuseums.org
Organiser: Oklahoma Museums Association
E-mail: sodaniel@okmuseums.org
Address: Oklahoma Museums Association 2100 NE 52nd Street Oklahoma City - OK 73111 Tel: +1 405 424 7757
Description: This seminar is divided into two parts, the first one was about bare bones of disaster planning and the second one was about post-disaster response. Focused topics involved situation evaluation, damage assessment, media destruction, health and safety issues, and salvage techniques.

- COURSE, 2004
Title: **Course on Health and Safety in Museums**
From: 19th of May 2004 To: 2nd of July 2004
Place: GW University
City: Washington
www: http:// www.gwu.edu
Organiser: GW University
Contact person: David Goldsmith
E-mail contact: eohdfg@gwumc.edu
Contact person: Catharine Hawks
E-mail contact: cahawks@aol.com
Address: TBA in Ross Hall George Washington University Campus 2121 Eye Street N.W Washington, D.C 20052 Tel/Fax: +1 703 876 9272
Description: This course was divided into six weeks and into two sessions. The first session was focused on an overview of museum occupations, workforces, museum terminology, museum facilities, health and safety hazards in museum, toxicology, safety programme, hazards communication standard. The second one dealt with heath hazard control, role of monitoring and surveillance, disaster planning and fire protection. This course was completed by visits of local museums.

- COURSE, 2004
Title: **Emergency Preparedness, Response and Recovery**
From: Available on request
Place: Amigos Organisation
City: Dallas
www: http://www.amigos.org/learning/catalog/
Organiser: Amigos Organisation Contact person: Shelby Sanette
E-mail contact: sanett@amigos.org
Address: Amigos Organisation 14400 Midway Road Dallas, Texas 75244-3509 Tel: +1 800 843 8482/ + 1 972 851 8000 Fax: + 1 972/991 6061
Description: This two-day workshop helps participants prepare for and limit various types of damage through risk assessment, disaster planning, and recovery procedures. Several disaster plans are provided as models, and each institution creates a framework for its own plan. Day One focuses on identifying hazards and developing the disaster plan, and is intended for the current or potential disaster team leaders. Day Two addresses response and recovery, including hands-on salvage activities.

- WORKSHOP, 2005
Title: Focus on Collection Care Workshop Series
From: 9 March 2005 **To:** 11 March 2005
City: San Diego, CA
www: http://www.bacc.org
Organiser: Balboa Art Conservation Center (BACC)
Contact person: Josephine Ihrke
E-mail contact: wrfso@bacc.org
Address:
BACC
PO Box 3755
San Diego, CA 9216363755

Tel. +1 619 236 9702 – **Fax** +1 619 236 0141
Description: This three-day workshop series is designed to provide an intensive training experience with a programmatic approach. The series provides an intensive training experience focused on the basic preservation themes of planning and management, preventive strategies, and emergency response and recovery.

- WORKSHOP, 2005
Title: Recovery of wet materials following a disaster
From: 9 May 2005 **To:** 13 May 2005
City: Shepherdstown, WV
Organizer: The American Institute for Conservation of Artistic and Historic Works (AIC)
www:
Contact Person: Eric Pourchot
E-mail contact: epourchot@aic-faic.org
Address:
Program Officer for Professional Development
AIC 1717 K Street NW, Suite 200
Washington, DC 20006
Tel. +1 202 452 9545 – **Fax** +1 202 452 9328
Description:
This course is designed for conservators, museum and library personnel working with mixed collections. The focus of this course is the management, handling and care of objects that have become wet because of disaster. Participants will learn techniques to prioritize, handle, pack, freeze, thaw and dry a variety of wet organic and inorganic artifact material; how to organize a salvage operation; what safety precautions are necessary to avoid exposure to mold and other inherent health risks; how to locate local, regional, and national resources for disaster recovery; necessary documentation procedures and how artifact materials react to differing recovery techniques (i.e., handling, packing, freezing and drying); and how to manage third party contracts (e.g., freeze-drying) in disaster recovery situations. First hand knowledge of the current Hurricane Recovery will be also presented by the instructors and host, who recently participated in the History Emergency Assistance Recovery Team (HEART) Phase I Recovery, coordinated by the American Association of State and Local History (AASLH) and Southeastern Museum Conference (SECM) with FEMA.

- WORKSHOP, 2005
Title: Salvage of Library Collections
From: 17 November 2005 **To:** 18 November 2005
City: Washington
www: http://www.loc.gov/preserv/iflacore.html
Organiser: The Preservation Directorate of the Library of Congress
Contact person: Dianne van der Reyden
E-mail contact: dvan@loc.gov
Address:
The Library of Congress
101 Independence Ave, SE
Washington, DC 20540
Description: In an effort to help victims of past and future natural disasters, such as the recent series of hurricanes, the Preservation Directorate of the Library of Congress will be holding a free two-day workshop on salvage of library collections. The workshop will be at the Library of Congress, and is offered on the occasion of the first meeting of members of the

International Federation of Library Associations Preservation and Conservation North American Network.

- WORKSHOP, 2005
Title: Recovery of Wet Materials Following a Disaster
From: 5 December 2005 **To:** 8 December 2005
Place: Stella Maris Retreat and Renewal Center Conference Center
City: Skaneateles, NY
www: http://www.westlakeconservators.com/recoveryofwetmaterialsworkshop
Organiser: West Lake Conservators
Contact person: Susan Blakney
E-mail contact:
Address:
West Lake Conservators,
PO Box 45, Skaneateles, NY 13152
Tel. +1 315 685 8534 – **Fax** +1 315 685 0027
Description: This course is designed for conservators, museum and library personnel working with mixed collections. The focus of this course is the management, handling and care of objects that have become wet because of disaster. Participants will learn techniques to prioritize, handle, pack, freeze, thaw and dry a variety of wet organic and inorganic artifact material; how to organize a salvage operation; what safety precautions are necessary to avoid exposure to mold and other inherent health risks; how to locate local, regional, and national resources for disaster recovery; necessary documentation procedures and how artifact materials react to differing recovery techniques (i.e., handling, packing, freezing and drying); and how to manage third party contracts (e.g., freeze-drying) in disaster recovery situations. First hand knowledge of the current Hurricane Recovery will be also presented by the instructors and host, who recently participated in the History Emergency Assistance Recovery Team (HEART) Phase I Recovery, coordinated by the American Association of State and Local History (AASLH) and Southeastern Museum
Conference (SECM) with FEMA.

- WORKSHOP, 2006
Title: After the Storm: Recovery of Wet Collections
Dates and Locations:
16 March 2006: National D-day Museum, 945 Magazine Street New Orleans, LA 70130 **Tel.** (504) 527-6012
17 March 2006: LSU Rural Life Museum, Essen Lane, Baton Rouge, LA, 70898 **Tel.** (225)765-2437
20 March 2006: National Center for Preservation Technology and Training, 645 University Parkway, Natchitoches, LA 71457 **Tel.** (318) 356-7444
Organizer: The American Institute for Conservation of Artisic and Historic Works (AIC)
www: http://www.ncptt.nps.gov/default.aspx?m=239
Contact Person: Mary Striegel
Contact Person: Sarah Jackson
E-mail contact: www.ncptt.nps.gov/wetrecovery
Address :
National Center for Preservation Technology and Training
645 University Parkway, Natchitoches, LA 71457, 8:30
Tel. +1 318 356 7444

Description: The American Institute for Conservation of Artistic and Historic Works (AIC) is taking lessons learned from the recovery effort to present a series of one-day workshops. This workshop is open to collections staff and volunteers charged with the care of cultural collections, and to members of the public whose personal property has been affected by storms and flooding. Professional conservators will present on numerous topics in disaster recovery based on documented research and first-hand experience. Instructors will cover the topics of personal safety, disaster planning, salvage and recovery (books, papers, photographs, textiles, metals, etc.), needed supplies and first steps after a disaster. Additionally, participants will have an opportunity to handle damaged materials similar to those they likely would encounter in their own collections.

- WORKSHOP, 2006
Title: Protecting Library Collections: Emergency Preparedness, Planning and Response
Date: 11 May 2006
Place: Loyola Marymount University
City: Los Angeles
www: http://www.usc.edu/org/LAPnet/index.html
Organiser: The Los Angeles Preservation Network (LAPNet)
Contact person: Linda Harris Mehr
E-mail contact: lmeher@oscars.org
Address:
Los Angeles Preservation Network, Inc.
c/o Christopher Coleman
UCLA, YRL-Collections
Research & Instructional Services
YRL 11630, Box 951575
Los Angeles, CA 90095-1575
Description: The main focus of the day will be on writing a disaster plan and understanding its component parts and how to gather the information to include. In the first moments of an emergency, personal safety is your priority. When people and structures are determined to be secure, you may be faced with the overwhelming job of putting your library back in order. The success you have will be the result of how well you have prepared. In this workshop, you will learn to: Write or update your library emergency plan. Use practical decision-making skills during an emergency. Conduct an assessment of your building. Set pre- and post-disaster action priorities for your library.

- WORKSHOP, 2006
Title: Focus on Collection Care Workshop Series
From: 7 June 2006 **To:** 9 June 2006
City: San Diego, CA
www: http://www.bacc.org
Organiser: Balboa Art Conservation Center (BACC)
Contact person: Josephine Ihrke
E-mail contact: wrfso@bacc.org
Address:
BACC
PO Box 3755
San Diego, CA 9216363755
Tel. +1 619 236 9702 – **Fax** +1 619 236 0141

Description: This three-day workshop series is presented by BACC at selected locations in California, Arizona, Oregon, and Washington, and is designed to provide an intensive training experience with a programmatic approach. The series provides an intensive training experience focused on the basic preservation themes of planning and management, preventive strategies, and emergency response and recovery.

- WORKSHOP, 2006
Title: Focus on Collection Care Workshop Series
From: 27 September 2006 **To:** 29 September 2006
Place: Erb Memorial Union (EMU) University of Oregon
City: Eugene, Oregon
www: http://www.bacc.org
Organiser: Balboa Art Conservation Center (BACC)
Contact person: Josephine Ihrke
E-mail contact: wrfso@bacc.org
Address:
BACC
PO Box 3755
San Diego, CA 9216363755
Tel. +1 619 236 9702 – **Fax** +1 619 236 0141
Description: This three-day workshop series is presented by BACC at selected locations in California, Arizona, Oregon, and Washington, and is designed to provide an intensive training experience with a programmatic approach. The series provides an intensive training experience focused on the basic preservation themes of planning and management, preventive strategies, and emergency response and recovery.

- WORKSHOP, 2006
Title: Recovery of wet materials following a disaster
From: 10 November 2006 **To:** 12 November 2006
Place: Intermuseum Conservation Association (ICA)
City: Cleveland, OH
Organizer: Intermuseum Conservation Association (ICA) with funding from the Cuyahoga County (OH) Department of Development
www:
http://www.ica-artconservation.org/education/RecoveryofWetMaterialsFollowingaDisaster-application.pdf
Contact Person: Emily Helwig
E-mail contact: ehelwig@ica-artconservation.org
Address:
Intermuseum Conservation Association (ICA)
2915 Detroit Ave.
Cleveland, OH 44113
Tel. +1 216 658 8700
Description: This course is designed for conservators, curators, collection managers and other museum and library personnel working with mixed collections. The focus of this hands-on course is the management, handling, and care of objects that have become wet because of disaster. Participants will learn how artifact materials react to differing recovery techniques (i.e., handling, packing, freezing and drying) through lectures and hands-on salvage. Participants will also learn to organize a salvage operation; how to minimize exposure to mold and other inherent health risks; how to locate local, regional, and national resources for

disaster recovery; carry-out necessary documentation procedures and how to manage third party contracts (e.g., freeze-drying) in disaster recovery situations.

- WORKSHOP, 2006
Title: Disaster Preparedness for Historic Properties
Date: 7 December 2006
Place: Baltimore Museum of Industry
City: Baltimore, Maryland
www: http://www.preservemd.org
Organiser: Preservation Maryland
Contact person: Kristen Harbeson
E-mail contact: kharbeson@preservationmaryland.org
Address:
Preservation Maryland
24 W. Saratoga St.
Baltimore, MD 21201
Tel. +1 410 685 2886
Description: Floods, fires, hurricanes, earthquake. What do you do when the worst happens? Historic properties, whether they are museums or private properties on Main Street, face unique challenges in responding to disasters in a way that preserves the public trust and the character of unique places. The key is in disaster preparedness, both creating a disaster plan and training staff to know the steps needed to implement it. Experts from a variety of agencies and historic sites will discuss the importance of disaster planning, and provide guidance on how to go about creating a disaster plan for your historic site, as well as what to do when a disaster strikes.

- ONE-DAY CLASS, 2006
Title: Disaster Recovery for Museum Collections
Date and Location:
13 December 2006: The Fox Theatre, Atlanta, GA
www: http://tinyurl.com/ljsjs
http://www.solinet.net/workshops/ws_details.cfm?doc_id=4257&WKSHPID=12DRMC
Organiser: SOLINET
Contact person: Vanessa Richardson
E-mail contact: vanessa.richardson@solinet.net
Address:
SOLINET
1438 West Peachtree Street NW, Suite 200
Atlanta, GA 30309-2955
Tel. 1 800 999 8558 toll free – **Fax** 404 892 7879
Description: It is likely that disaster will strike your museum, disrupting services and causing damage to the objects, collections and building. Is you institution prepared to handle both minor incidents and large-scale emergencies? Fire, smoke, flooding, burst or leaky pipes, and other disasters can damage collections. Museum staff must be prepared to execute a salvage and response operation. This half-day class will focus on how to prevent unnecessary loss of museum materials by focusing on recovery techniques for: painting, furniture, textiles and objects. This class is designed for staff members interested in gaining experience in the recovery and salvage of museum materials

- ONE-DAY CLASS, 2006/2007
Title: Disaster Preparedness
Dates and Location:
3 October 2006: Cape Fear Community College, Wilmington, NC
12 December 2006: The Fox Theatre, Atlanta, GA
15 February 2007: University of South Alabama, Mobile AL
13 March 2007: Gulf Coast Community College, Panama city, FL
www: http://tinyurl.com/b3zlv
http://www.solinet.net/workshops/ws_details.cfm?doc_id=3013&WKSHPID=12DPR
Organiser: SOLINET
Contact person: Vanessa Richardson
E-mail contact: vanessa.richardson@solinet.net
Address:
SOLINET
1438 West Peachtree Street NW, Suite 200
Atlanta, GA 30309-2955
Tel. 1 800 999 8558 toll free – **Fax** 404 892 7879
Description: Libraries and archives are vulnerable to a variety of disasters. Collections have been damaged by fire, smoke, flooding, burst or leaking pipes, and a host of other disasters. To prevent unnecessary loss of materials, librarians and archivists must be prepared to handle both minor incidents and large-scale emergencies. This requires that institutions have knowledgeable staff and written plans for dealing with emergency situations, so that fewer disasters occur and damaged materials can be salvaged successfully. Library staff must also be trained in proper recovery techniques and procedures. This one-day class will provide the training necessary to plan, organize, and execute a disaster plan and a salvage operation. In addition to in-depth discussion on the disaster planning process, there will be demonstrations of salvage techniques, including air-drying books, packing out wet materials, separating and drying manuscripts, rinsing books, and drying photographic materials. This class is designed for staff members responsible for, or interested in, organizing and implementing institutional or cooperative disaster preparedness and response procedures.

- WORKSHOP, 2007
Title: Focus on Collection Care Workshop Series
Date: January 2007
City: Tucson, Arizona
www: http://www.bacc.org
Organiser: Balboa Art Conservation Center (BACC)
Contact person: Josephine Ihrke
E-mail contact: wrfso@bacc.org
Address:
BACC
PO Box 3755
San Diego, CA 9216363755
Tel. +1 619 236 9702 – **Fax** +1 619 236 0141
Description: This three-day workshop series is presented by BACC at selected locations in California, Arizona, Oregon, and Washington, and is designed to provide an intensive training experience with a programmatic approach. The series provides an intensive training experience focused on the basic preservation themes of planning and management, preventive strategies, and emergency response and recovery.

- WORKSHOP, 2007
Title: Managing Preservation (a Series of Five Coordinated Workshops): Emergency Preparedness
From: 7 March 2007 **To:** 9 March 2007
Place: Northeast Document Conservation Center (NEDCC)
City: Andover, MA
www: http://www.nedcc.org
Organiser: Northeast Document Conservation Center (NEDCC)
Contact person: Lori Foley
E-mail contact: lfoley@nedcc.org
Address:
NEDCC
100 Brickstone Square
Andover, MA 01810
Tel. +1 978 470 1010 - **Fax** +1 978 475 6021
Description: The Managing Preservation Workshop series is designed to provide preservation training for staff of small to mid-sized museums, historical organizations, archives, libraries, and other records repositories. The workshops will provide the information needed to design, implement, and maintain an effective preservation program for documents, books, photographs, and other paper-based materials. Each participant will learn how to prepare a basic preservation plan with concrete, realistic goals for future activities.

- PROGRAM 2007
Title: The Conservation Center for Art and Historic Artifacts (CCAHA) Vulnerability Assessment Program
Contact person: Laura Hortz Stanton
Director of Preservation Services
Conservation Center for Art and Historic Artifacts
264 S. 23rd St.
Philadelphia, PA 19103
Tel: 215-545-0613
Fax: 215-735-9313
Email contact: lhortzstanton@ccaha.org

Contact: Preservation Services Office
Conservation Center for Art and Historic Artifacts (CCAHA)
264 South 23rd Street
Philadelphia, PA 19103
Tel: 215-545-0613
Fax: 215-735-9313
Email contact: ccaha@ccaha.org
Website: http://www.ccaha.org>
Description:
Being prepared and identifying the potential threats to one's institution are the best ways of mitigating risks to cultural collections. According to Building an Emergency Plan: A Guide for Museums and Other Cultural Institutions, published by the Getty Conservation Institute, the first step in creating a disaster plan is "to prepare a report identifying what natural or human-caused emergencies may threaten the institution." This report is usually referred to as a vulnerability assessment. Organizations cannot move ahead to the development of a

disaster plan without a clear-eyed understanding of the areas where their institution is most vulnerable to loss and damage.

The Conservation Center for Art and Historic Artifacts (CCAHA) is seeking applicants to participate in its Vulnerability Assessment Program. Institutions that are selected through this competitive application process will receive a one day on-site consultation and a written vulnerability assessment, which can become the basis for future disaster planning efforts. In addition, CCAHA staff will review any subsequent disaster planning documents and make suggestions for the successful implementation of the plan.
Process: During the on-site consultation, CCAHA staff reviews and examines the institution's environment, history, location, structural needs, pest control, fire protection, security procedures, local resources, and training requirements. Insurance considerations, collections documentation, and collections salvage priorities are also addressed. The written report provides observations, recommendations, and resources to serve as a guide in the development of a comprehensive disaster plan for the institution.

- WORKSHOPS 2008
Title: From Vulnerable to Vigilant
Organiser: Conservation Center for Art and Historic Artifacts (CCAHA)
Place: University of Pennsylvania Museum of Archaeology and Anthropology
3260 South Street
City: Philadelphia, PA.
Contact person: Kelly Ferguson
Conservation Center for Art & Historic Artifacts
264 South 23rd Street
Philadelphia, PA 19103
Tel: 215.545.0613
Fax: 215.735.9313
Email contact: kferguson@ccaha.org
Website: www.ccaha.org, www.ccaha.org/workshop_cal.php
Contact: CCAHA's Preservation Services Office
Tel: 215-545-0613.

Title: Disaster Mitigation for Cultural Collections: Risk Assessment and Crisis Communication
Date: Thursday, 10th of May 2007
Price: $90.00 for CCAHA members, $100.00 for non-members

Title: Protecting Cultural Collections: Emergency Preparedness and Response Friday
Date: 11th of May 2007
Price: $90.00 for CCAHA members, $100.00 for non-members

These workshops will be held at and are cosponsored by the University of Pennsylvania Museum of Archaeology and Anthropology, and are partially subsidized through funding from the National Endowment for the Humanities, the Gladys Krieble Delmas Foundation, and the Independence Foundation.

- **Other**

- ONLINE COURSE, 2005
Title: Disaster Planning II: Writing a Disaster Preparedness Plan
From: 6 February 2006 **To:** 17 March 2006
From: 6th of November 2006 **To:** 15th of December 2006
Place: Northern States Conservation Center
www: http://www.collectioncare.org/tas/tas.html
http://www.museumclasses.org
Organiser: Northern States Conservation Center
Contact person: Helen Alten
E-mail contact: hellen@collectioncare.org
Address:
Northern States Conservation Center
P.O. Box 8081, St. Paul, MN 55108
Tel. +1 651 659 9420
Description: The purpose of a Written Disaster Preparedness and Response Plan is to educate all participants in their role and responsibilities in an emergency situation. Each participant from the planning team will be required to research and fully understand the emergency response and recovery steps. Participants will learn how to document the collection so you know what collection information is useful before an emergency. You will identify important institutional records, collection inventories, research materials, location of certain items on exhibit and in storage. A copy of records to be stored off-site will include blue prints, inventory lists, hazardous materials list, computer back-ups, financial records, community partners telephone lists, and Emergency Response Salvage Wheel. You will become familiar with other emergency information and documentation systems, such as Homeland Security, Red Cross, FEMA, and local government entities. Participants will receive an emergency preparedness and response supply list and participants will customize it for specific threats. As you write the DPRPlan you will also begin assembling supplies. The instructor will guide you through each step, assist you with checklists forms, organization, review narratives, edit the final written plan, and guide you to grant funding for on-site or regional training to conduct practice drills.

- ONLINE COURSE, 2005
Title: Disaster Planning II: Writing a Disaster Preparedness Plan
From: 31 October 2005 **To:** 16 December 2005
Place: Internet
www: http://www.collectioncare.org/tas/tas.html http://www.museumclasses.org
Organiser: Northern States Conservation Center
Contact person: Helen Alten
E-mail contact: hellen@collectioncare.org
Address:
Northern States Conservation Center
P.O. Box 8081, St. Paul, MN 55108
Tel. +1 651 659 9420
Description: The purpose of a Written Disaster Preparedness and Response Plan is to educate all participants in their role and responsibilities in an emergency situation. Each participant from the planning team will be required to research and fully understand the emergency response and recovery steps. Participants will learn how to document the collection so you know what collection information is useful before an emergency. You will identify important institutional records, collection inventories, research materials, location of certain items on exhibit and in storage. A copy of records to be stored off-site will include blue prints,

inventory lists, hazardous materials list, computer back-ups, financial records, community partners telephone lists, and Emergency Response Salvage Wheel. You will become familiar with other emergency information and documentation systems, such as Homeland Security, Red Cross, FEMA, and local government entities. Participants will receive an emergency preparedness and response supply list and participants will customize it for specific threats. As you write the DPRPlan you will also begin assembling supplies. The instructor will guide you through each step, assist you with checklists forms, organization, review narratives, edit the final written plan, and guide you to grant funding for on-site or regional training to conduct practice drills.

- ONLINE COURSE, 2006
Title: Disaster Planning I: Introduction to Disaster Preparedness Plan
From: 9 January 2006 **To:** 4 February 2006
From: 7th of August 2006 **To:** 1st of September 2006
Place: Northern States Conservation Center
www: http://www.collectioncare.org/tas/tas.html
http://www.museumclasses.org
Organiser: Northern States Conservation Center
Contact person: Helen Alten
E-mail contact: hellen@collectioncare.org
Address:
Northern States Conservation Center
P.O. Box 8081, St. Paul, MN 55108
Tel. +1 651 659 9420
Description: The purpose of a Written Disaster Preparedness and Response Plan is to educate all participants in their role and responsibilities in an emergency situation. Each participant from the planning team will be required to research and fully understand the emergency response and recovery steps. Participants will learn how to document the collection so you know what collection information is useful before an emergency. You will identify important institutional records, collection inventories, research materials, location of certain items on exhibit and in storage. A copy of records to be stored off-site will include blue prints, inventory lists, hazardous materials list, computer back-ups, financial records, community partners telephone lists, and Emergency Response Salvage Wheel. You will become familiar with other emergency information and documentation systems, such as Homeland Security, Red Cross, FEMA, and local government entities.

- VIRTUAL FORUM, 2006
Title: Volunteers sought for disaster response
Place: SoliNET
www: http://www.solinet.net/preservation/disaster
Organiser: SoliNET
Contact person: Kara M. McClurken
E-mail contact: kmcclurken@solinet.net
Address:
SoliNET
1438 West Peachtree Street NW, Suite 200
Atlanta, GA 30309-2955
Tel. 1 800 999 8558 toll free – **Fax** 404 892 7879
Description: Preservation Field Services of the Southeastern Library Network(SOLINET) is gathering the names of individuals who are willing to volunteer their time and talents in the

event of a disaster. We are gathering the names and contact information of those interested in aiding institutions that have been affected by a flood, fire, tornado, hurricane, or other disaster. We are seeking two kinds of volunteers. Participants in this program can volunteer to go on-site and help with salvage (such as packing materials out of a damaged environment, cleaning moldy materials, removing debris, air drying materials, or reshelving them after they have been dried). We are also looking for volunteers who are willing to serve as preservation consultants (either on-site or over-the phone.) Signing up to volunteer on SOLINET's new disaster website does not commit you to volunteer should an institution need you. It only provides us with a list of possible resources for institutions in need.

- ONLINE COUSE, 2006
Title: Disaster Series: Disaster Preparedness and Hurricane Preparedness Classes
Dates: April, May 2006
www: http://www.solinet.net/preservation/disasterseries
Organiser: SOLINET
Contact person: Vanessa Richardson
E-mail contact: vanessa.richardson@solinet.net
Address:
SOLINET
1438 West Peachtree Street NW, Suite 200
Atlanta, GA 30309-2955
Tel. 1 800 999 8558 toll free – **Fax** 404 892 7879
Description: In an effort to promote disaster preparedness around the southeast, SOLINET is offering a series of disaster classes. Locations of the classes include: Jackson, MS, Baton Rouge, LA, Nashville, TN, Kingsland, GA, and Panama City Beach, FL.

- ONLINE WORKSHOP, 2006
Title: Risk Management for Libraries and Cultural Collections: Did Our Insurance Policy Say That?
Date: 5 May 2006
www:
http://www.solinet.net/workshops/ws_details.cfm?doc_id=3002&WKSHPID=12DOIPST
Organiser: SOLINET
Contact person: Vanessa Richardson
E-mail contact: vanessa.richardson@solinet.net
Address:
SOLINET
1438 West Peachtree Street NW, Suite 200
Atlanta, GA 30309-2955
Tel. 1 800 999 8558 toll free – **Fax** 404 892 7879
Description: This workshop is designed for librarians, archivists, and museum registrars and collections managers involved in disaster preparedness and/or interested in risk management and insurance issues for cultural collections. This full-day workshop will help participants understand the issues involved in risk management and insurance for library and cultural collections. Risk management techniques assist in determining the likelihood of hazards. Elimination of hazards or lessening their impact helps in determining appropriate insurance needs. The session includes lecture, discussions and break out sessions highlighting the following topics: Valuation of Collections; Types of Property Insurance; Specific Materials; Contracting; FEMA.

- WEB-BASED TRAINING, 2006
Title: Developing a Disaster Plan (Live Online)
Dates: 25 January 2006, (Follow-up session on February 8 and February 22, 2006)
www: http://www.solinet.net/workshops/ws_details.cfm?doc_id=3004&WKSHPID=12DD
Organiser: SOLINET
Contact person: Vanessa Richardson
E-mail contact: vanessa.richardson@solinet.net
Address:
SOLINET
1438 West Peachtree Street NW, Suite 200
Atlanta, GA 30309-2955
Tel. 1 800 999 8558 toll free – **Fax** 404 892 7879
Description: Disaster planning requires the support and commitment of staff from many departments, including facilities and fiscal affairs. Plan preparation is more successful and effective when undertaken by a committee with staff representatives from across the institution. This web-based class is designed to support the work of an institution's disaster planning committee. Homework assignments will require input and support from a variety of staff members. Taught in 3 two-hour sessions over the course of six weeks, it guides participants through the development of a written disaster plan. The modules cover: establishment of a planning structure, information gathering, including risk assessment and resource list development, setting recovery priorities, an overview of recovery procedures, plan development, and working with disaster recovery vendors.

- WEB-BASED TRAINING, 2006/2007
Title: Developing a Disaster Plan (Live Online)
Dates and Location:
9 October 2006 (Follow-up session on October 23 and November 6, 2006): Distance Education
21 February and 21 March 2007: Distance Education
www: http://tinyurl.com/da7ex
http://www.solinet.net/workshops/ws_details.cfm?doc_id=3004&WKSHPID=12DDP#
Organiser: SOLINET
Contact person: Vanessa Richardson
E-mail contact: vanessa.richardson@solinet.net
Address:
SOLINET
1438 West Peachtree Street NW, Suite 200
Atlanta, GA 30309-2955
Tel. 1 800 999 8558 toll free – **Fax** 404 892 7879
Description: To prevent unnecessary loss of materials, institutions need knowledgeable staff and written plans for dealing with emergency situations so that fewer disasters occur and damage is minimized. Disaster planning requires the support and commitment of staff from many departments, including facilities and fiscal affairs. Plan preparation is more successful and effective when undertaken by a committee with staff representatives from across the institution.
This web-based class is designed to support the work of an institution's disaster planning committee. Homework assignments will require input and support from a variety of staff members. Taught in three two-hour sessions over the course of six weeks, it guides participants through the development of a written disaster plan. The modules cover establishment of a planning structure, information gathering, including risk assessment

and resource list development, setting recovery priorities, an overview of recovery procedures, plan development, and working with disaster recovery vendors. This class is designed for staff members responsible for organizing, writing, and implementing an institution-wide disaster-preparedness plan in academic, public, and special libraries, archives, and historical societies. Participants are invited to submit their completed plans for review. Partial funding for this workshop has been provided by a grant from the National Endowment for the Humanities, Division of Preservation and Access.

- ONLINE COURSE 2007
Title: Collections Management Policies for Museums and Related Institutions
Instructor: William G. Tompkins
Dates: (Available twice in 2007)
From: 19 March To: 13April 2007
From: 3 September **To**: 28 September 2007
Price: $395
Location: online at http://www.museumclasses.org
Description: Acquiring and holding collections impose specific legal, ethical and professional obligations. Museums must ensure proper management, preservation and use of their collections. A well-crafted collections management policy is key to collections stewardship. Collections Management Policies for Museums and Related Institutions helps participants develop policies that meet professional and legal standards for collections management.

- ONLINE COURSE 2007
Title: Disaster Plan Research and Writing
Instructor: Terri Schindel
Dates: (Available twice in 2007)
From: 5 March **To**: 13 April 2007
From: 29 October To**:** 7 December 2007
Price: $475
Location: www.museumclasses.org
Description:
Every museum needs to be prepared for fires, floods, chemical spills, tornadoes, hurricanes and other disasters. But surveys show 80 percent lack trained staff, emergency-preparedness plans for their collections, or both. Disaster Plan Research and Writing begins with the creation of disaster-preparedness teams, the importance of ongoing planning, employee safety, board participation and insurance. Participants will learn everything they need to draft their own disaster-preparedness plans. They also will be required to incorporate colleagues in team-building exercises.

- ONLINE DISCUSSION 2007
Title: Collection Protection: Are You Prepared?
Date: 14th March 2007
It will be held twice in 2007.
Contact person: Helen Alten
Email contact: Helen@collectioncare.org
Website: http://www.museumclasses.org
Instructor: Terri Schindel
Price: $75

Description:
Disaster planning is overwhelming. Where do you start? Talk to Terri about how to get going. Use her check list to determine your level of preparedness. What do you already have in place? Are you somewhat prepared? What can you do next?
Logistics: Participants in Collection Protection will read literature and complete a checklist before joining a one-hour chat to discuss disaster preparedness at their institutions.
Participants in Collection Protection will be sent information the week before the chat. Each student should read course materials and prepare questions or comments to share with the other students in the chat.
This is a mini-course and takes no more than 10 hours of a student's time.

VI LIST OF CONFERENCES

Austria

- INTERNATIONAL CONFERENCE, 2003
Title: Threatened Museums. Disaster, Theft, Terrorism ("Bedrohte Museen. Naturkatastrophen, Diebstahl, Terror")
From: 18 May 2003 **To:** 21 May 2003
Place: Bregenzer Festspiel- und Kongreßhaus
City: Bregenz
Organizer: ICOM-Austria National Committee in cooperation with ICOM National Committees of Germany and Switzerland
Contact Person: Armine Wehdorn, ICOM-Austria
E-mail contact: armine.wehdorn@oenb.co.at
Address:
ICOM - Österreichisches Nationalkomitee
Burgring 5, A-1010 Wien
Tel. +43 1 40420 6631 – **Fax** +43 1 40420 6695
Description: ICOM's three national committees within the German speaking region meet every third year at the Lake Constance Symposium (former: Lindau-Symposium) for an international conference. After the overwhelming impact of the floods in August 2002 on parts of Austria, Czech Republic and Germany the organizing committee proposed to change the subject to this actual topic. But the conference dealt not only with flood disaster, it also covered four other topics: fire, theft, minimizing risks, protection of cultural property. The papers have been published by ICOM-Austria in 2004.

- CONFERENCE, 2002
Title: Security and Disaster Management in Museums ("Sicherheit und Katastrophenschutz im Museum")
From: 21 October 2002 **To:** 22 October 2002
Place: Diözesanmuseum Graz

City: Graz
Organizer: ICOM-Austria National Committee
Contact Person: Heimo Kaindl, Diözesanmuseum Graz
E-mail contact: heimo.kaindl@graz-seckau.at
Address: Mariahilfplatz 3, A-8020 Graz
Tel. +43 316 713994 – **Fax** +43 316 710224
Description: This Seminary had been planned in autumn 2001 - well before floods devastated parts of Austria. This coincidence stresses one central message of the meeting: to be always prepared, because disasters occur without early warning. The subject was dealt with in three sections: disasters caused by nature; human impact (e.g. war); preventive measures. The papers have been published in 2003.

Bosnia and Herzegovina

- INTERNATIONAL CONGRESS, 2001

Title: Catastrophies and Catastrophy Management in Museums
From: 17th of April 2001 To: 21st of April 2001

Place: *Zemaljski Muzei and Rooms of Dom Armije*
City: Sarajevo
Organiser: Tiroler Landesmuseum Ferdinandeum Innsbruck and Zemaljski
Contact person: Dr Dzenana Buturovic
E-mail: z.muzej@bih.net.ba
Contact person: Gerhard M. Tarmann
E-mail: g.tarmann@tiroler-landesmuseum.at
Contact person: Dr Sylvia Mader
E-mail: z.muzej@bih.net.ba
Address: Zemalijski Muzej Bosne i Herzegovine Zmaja of Bosne 3 BIH-71000 Sarajevo,
Tel/Fax: + 387 33 262 710
Description: Both museums have suffered from ware and have experience in protecting and restoring their infrastructure and collections. This congress was organised in different general thematic sessions as well as the general sessions which were focused on: earth and science collection, biological collection, historical collections and art collection.

Canada

- INTERNATIONAL CONFERENCE, 2006
Title: Cultural Property Protection Conference
From: 16 January 2006 **To:** 17 January 2006
City: Ottawa
www: http://www.museums.ca/protection/en/index.html
Organizer: The Canadian Museum Association (CMA) in partnership with the Canadian War Museum
E-mail contact: info@museums.ca
Address:
Canadian Museums Association
280 Metcalfe St., Suite 400
Ottawa, Ontario K2P 1R7 Canada
Tel. +1 613 567 0099– **Fax** +1 613 233 5438
Description: Museums, and related institutions, protect our cultural heritage. They provide for the long-term care and safety of our collective heritage while protecting employees, visitors, and facilities. With an increase in organized art crime, terrorist activities, natural disasters, and internal theft, what is the best course of action for ensuring the safety of the collections, the people, and the building? Directors, Facilities Managers, and Museum Security Professionals came together for this two-day conference, which presented an exciting opportunity to learn from sessions led by experts, to exchange knowledge and experience with peers, and to investigate the latest tools and strategies in museum security. Key Themes: Emergency Issues, Security Best Practices, Risk Assessment, Emergency Preparedness and Recovery.

- CONFERENCE and WORKSHOP, 2006
Title: 32nd Annual CAC Conference and Workshop on Risk Management for Cultural Institutions and Collections
From: 15 May 2006 **To:** 19 May 2006
Place: St. Michael's College
City: Toronto, Ontario
www: www.cac-accr.ca
Organizer: Canadian Association for Conservation/Association Canadienne pour la Conservation et la Restauration (CAC/ACCR)
E-mail contact: coordinator@cac-accr.com
Address:
CAC
P.O. Box 87028, 322 Bank Street
Ottawa, ON, K2P 1X0
Tel. +1 613 231 3977 - **Fax** +1 613 231 4406
Description: This year's workshop theme is Risk Management. Workshop: This two-day workshop will provide a forum where museum professionals, conservators and educators can share ideas and learn about Risk Management. Workshop content will be delivered as case studies, group-discussions and panel presentations. Experienced lecturers will coordinate workshops and participate in general discussions. A workshop reception will be held on Sunday evening, May 14, 2006 at the Bata Shoe Museum. The Conference Abstracts have been published in 2006.

France

- INTERNATIONAL CONGRESS, 2000
Title: **Disasters Prevention in Storage Areas**
From: 6th of November 2000 To: 10th of November 2000
Place: Laboratoire de Conservation, Restauration et Recherche
City: Draguignan
Organiser: International Committee of Blue Shield
Contact person: Jacques Ribière and William Mourey
E-mail contact: cav@cav-recherches.org
Address: Centre du Var 19 rue Frédéric Mireur 83300 Draguignan
Tel: + 33 4 94 68 90 15 Fax: +33 4 94 85 04 04

-SYMPOSOSIUM, 2006
Title: The 3-D's of preservation: disasters, displays, digitization
From: 8 March 2006 **To:** 10 March 2006
Place: Bibliothèque Nationale de France, Site François-Mitterrand
City: Paris
Organizer: Bibliothèque Nationale de France , International Federation of Library Association (IFLA), IFLA Preservation and Conservation Section and IFLA Core Activity on Preservation and Conservation (PAC)
www: http://www.bnf.fr/pages/infopro/journeespro/dri-conservation_gb.htm
Contact Person: Marie-Thérése Varlamoff
E-mail contact: marie-therese.varlamoff@bnf.fr
Address:
Bibliothèque Nationale de France, Site François-Mitterrand
Quai François-Mauriac
75706 Paris Cedex 13
Tel. +33 1 53 79 59 59 – **Fax** +33 1 53 79 59 80
Description: Recent disasters around the world have highlighted the need for better planning and preparation to ensure the survival of library collections and cultural materials. Increasing numbers of exhibitions of library and archival materials point to the need for standards and best practices to make certain displayed items are not damaged. Digitization of materials is burgeoning around the world, yet we are not certain of the status of preservation of these important files. 3-D films have once again become popular, especially in the IMAX format. 3-D glasses put the viewer in the middle of the action, as the actors seem to emerge from the screen. In much the same way, certain issues in preservation seem to emerge above others and surround librarians and archivists, clamoring for attention of leaders in the field. Preservation experts from around the world will gather at the Bibliothèque Nationale de France on March 8-10, 2006, to present papers and discuss these issues with members of the IFLA PAC Regional Directors and members of the IFLA Standing Committee on Preservation and Conservation.

Germany

- INTERNATIONAL CONFERENCE, 2002
Title: Disaster Management for Cultural Institutions (Focused on Museums) ("Katastrophenschutz für kulturelle Einrichtungen" (Schwerpunkt Museum)
Date: 27 November 2002
Place: Staatliche Kunstsammlungen Dresden, Münzkabinett
City: Dresden

Organizer: Staatliche Kunstsammlungen Dresden, Generaldirektion
www: http://www.skd-dresden.de/en/.html
Contact Person: Martin Roth
E-mail contact: Martin.Roth@skd.smwk.sachsen.de
Contact Person: Bettina Pobst
Contact Person: Michael John
Address:
Georg-Treu-Platz 2
01067 Dresden
Tel. +49 351 4914700 – **Fax** +49 351 4914777
Description: The heavily affected Dresden State Art Collections had been very efficient in rescuing threatened works of art: about 23.000 objects had been moved and saved within a very short time. But this was mainly due to very high commitment of staff and citizens as well as to the art of improvisation. It was not the result of thorough preparation on such a disaster; e. g. the relatively new painting depot proved to be inadequately protected from floods. Before going ahead with their new plans on disaster preparedness, on disaster management and especially on building a new depot, the museum organized this hearing of national and international experts, among others Ken Golding (Heritage Safety Management Services, GB) and Wilbur Falk (Getty Conservation Institute, USA). The papers have been published by Dresden State Art Collections in 2003.

- REGIONAL CONFERENCE, 2002
Title: Floods and Museums ("Hochwasser und Museen")
From: 19 October 2002 **To:** 20 October 2002
Place: Wasserschloß Klaffenbach
City: Chemnitz
Organizer: Saxonian Museums Association in cooperation with Museums Associations of Sachsen-Anhalt and Thuringia (sponsorship)
www: http://www.schlossbergmuseum.de/tsunami/index.html#Archive
Contact Person: Thomas Schuler
E-mail contact: Th.Schuler@t-online.de
Address: Wasserschloßweg 6, D-09123 Chemnitz
Tel. +49 371 2601007
Description: Only directors of damaged museums were invited. After eight extremely difficult weeks they left their town (mostly for the first time after the floods) for an exchange of experiences. Meeting their colleagues had the quite important aim of allowing a bit of distance from local problems and help each other to cope better with the physical and mental stress of disaster experience and of recovery efforts. The lasting outcome was an intense brainstorming about everything one should have prepared better or at least should have thought of. Fresh memories and a great diversity of situations and problems were a very good source to compile a checklist of preventive measures (published in 2003).

- CONFERENCE, 2003
Title: Preparing for the Worst, Planning for the Best: Protection our Cultural Heritage from Disaster
From: 30th of July 2003 **To**: 1st of August 2003
Place: Akademie der Wissenschaften
City: Berlin
Website: http://www.ifla.org/VII/s19/sconsv.htm
Organiser: Akademie der Wissenschaften

Contact person: Johanna Wellheiser
Email contact: jwellheiser@tpl.toronto.on.ca
Address: Jägerstraße 22/23 10117 Berlin-"Mitte"
Tel: +49 30 20 37 00
Fax: +49 30 20 37 05 00
Description: This programme is designed to inform and enable library and archives administrators effectively to prepare for, react and respond to, and recover from disasters, both natural and man-made. It was focused on learn about national level policy planning and local initiatives, find out about the International Committee of the Blue Shield, share the experience of disaster plans action (theory and practice), understand the human factor in disaster response, hear about critical lessons (flood, fire, hurricane, etc.), explore priorities for salvage of collections, hear about disaster management developments and models for risk assessment and discover new recovery techniques and technologies.

CONFERENCE 2007
Title: Vom Umgang mit Katastrophen und Risiken vor Ort
Date: 19.1.2007
Place: Westfälischen Industriemuseum Zeche Nachtigall
City: Witten
Organiser: Verein "Historikerinnen und Historiker vor Ort e.V."
Contact person: Stefan Nies
Email contact: nies@dudde-nies.de, tagung@historiker-vor-ort.de
Address: Historikerinnen und Historiker vor Ort e.V.
c/o Dr. Frank Ahland
Humboldtstraße 12
58452 Witten
Tel: 0 23 02 / 203 59 05
Fax: 0 23 02 / 203 59 0

- CONFERENCE 2008
Title: Risk Assessment - Management Strategies
From: 14 February 2008 To: 16 February 2008
Place: Stadthalle am Schloss
City: Aschaffenburg/Germany
Organisator: International Conference of the Restorers Association of Germany (VDR - Verband der Restauratoren e.V.)
Contact: Alexandra Schieweck
Email contact : alexandraschieweck@gmx.net
FG-PraeventiveKonservierung@gmx.net
Tel: +49 531 2155 924
Fax: +49 531 2155 905

Greece

- CONFERENCE, 2005
Title: Vulnerability of 20th century cultural heritage hazards and prevention measures
From: 3 October 2005 **To:** 5 October 2005
Place: KICC Kos International Convention Centre
City: Kos

Website: http://associazioni.comune.fi.it/cicop/italiano/congressi.htm
Organizer: International Centre for Preservation of the Architectural Heritage CICOP-Greece
Contact Person: Andreas Giacumakatos
E-mail contact: agiacum@arch.auth.gr
Address:
CICOP- Greece
C/o Dep.tment of History of Architecture and Architectural Conservation Aristoteleion University of Thessalonik
Thessaloniki
Tel. +30 2 310 995481 – **Fax** +30 2 310 995552
Address:
CICOP-Italy
C/o Dep.tment TA & D, University of Florence,
Via S. Niccolò 89a
50125 Firenze, Italy
Tel. +39 055 2491547/527, **Fax** +39 055 2491 523
Description: The Conference will provide a forum for scientists and experts in the field of vulnerability of cultural heritage to natural and technological hazards field in order to improve and update information about scientific achievements and policy in risk management. Dodecanese Islands are the appropriate location to discuss risk assessment and remedy strategies of the cultural heritage, because of its multiethnological and millenary culture as well as for the expression of intra-European cooperation and exchanges between Europe and the other continents. Every work-session will be organised with keynote lectures, critical presentation of the papers by the session co-ordinator, oral presentation of papers presented by the participants, debates and poster sessions. The fundamental purpose of the Congress undertaking is to contribute to the formulation of policies and of strategies for the preservation of modern (tangible and intangible) cultural heritage by fostering synergisms between modern science and local knowledge.

India

- INTERNATIONAL CONGRESS, 2004
Title: Natural Disasters Mitigation
From: 19th of February 2004 To: 21st of February 2004
Place: The Institution of Engineers
City: New-Delhi
www: http://www.wfeo-cee.org/ndm.htm
Organiser: The Institution of Engineers
Contact person: Prof. Jose Medem Sanjuan (Spain)
Contact person: Prof. G. P. Lal
E-mail contact: tmcwec@del3.net.in
Address: The Institution Of Engineers Bahadurshah Zafar Marg New Delhi 11002
Tel: +91 11 33 70 168/ 33 70 548
Fax: +91 11 33 78 851
Description: The object of the World Congress is to provide a multidisciplinary forum for engineers, architects, planners, technocrats, scientists, disaster managers, international and voluntary agencies and others working for the field of natural disaster mitigation and management to meet and share ideas, achievements and experiences. Exclusive time will be

provided for authors to present their work through poster sessions and interact with delegates of eminence in their chosen specialised fields.

- WORLD CONFERENCE, 2003
Title: Disaster Management, Infrastructure, and Control Systems (DMIC)
From: 29th of October 2003 To: 31st of October 2003
Place: Jawaharlal Nehry Technological University
City: Hyderabad
Organiser: Jawaharlal Nehru Technological University
Contact person: Prof. Anjaneyulu
E-mail contact: dmic2003@schanisj.com and jntuenviron@satyam.net.in
Address: Centre for Environment Institute of Post Graduate Studies Jawaharlal Nehry Technological University Mahaveer Marg Hyderabad 500 028
Tel: + 91 040 55 58 97 06
Description: This conference focused on the mitigation of disasters through control systems and infrastructure development. It is aimed at a wide, interdisciplinary audience with the goal of providing a common platform to discuss and plan disaster preventive measures, compare strategies and experiences from around the world, and broadly disseminate information. Conference themes include disasters that are geologic, medical, terrorist, and water and climate related.

- SECOND WORLD CONFERENCE, 2003
Title: Disaster Management-Case Histories of Disasters
From: 14th of November 2003 To: 16th of November 2003
Place: Birla Institute of Technology and Sciences
City: Pilani
www: http://www.bits-pilani.ac.in
Organiser: Birla Institute of Technology and Sciences (BITS)
Contact person: Satyendra P. Gupta
E-mail contact: spgupta@bits-pilani.ac.in and spguptaus@yahoo.com
Address: Civil Engineering Group Birla Institute of Technology and Sciences Vidhya Vihar Campus Pilani Rajasthan 333031
Tel: +91 01596 24 50 73/4 **Fax**: +91 01596 24 41 83
Description: The focus of the conference will be on earthquakes, floods, cyclones, and drought. Conference organizers have solicited a wide variety of case histories of disaster management from around the world. Case studies and histories will be presented with the goal of learning from others' experiences and building a multidisciplinary common network of best practices and policies.

- INTERNATIONAL CONFERENCE, 2007
Title: 12th International Conference of National Trusts (ICNT) on Heritage and Development
From: 3 December 2007 **To:** 5 December 2007
City: New Delhi
www: http://www.intach.org/international_conferences.htm
Organiser: The Indian National Trust for Art and Cultural Heritage (INTACH)
Contact person: Vani Subramanian
E-mail contact: intachculturalaffaires@yahoo.co.uk intach@del13.vsnl.net.in
Address:

INTACH 71, Lodhi Estate
NEW DELHI 110003
Tel. 91 11 2463 1818 - **Fax** 91 11 2461 1290
Description: The overarching theme for this conference is Heritage and Development. This theme is particularly appropriate in the context of the host city. New Delhi is a vibrant and multi-layered metropolis with evidence of settlements from pre history, the ruins of medieval cities, the functioning colonial city and buildings, and the extensive additions made during the 60 years. It is the capital of a fast developing country in which the past and present co-exist in a complex palimpsest that provides opportunities to actually experience the conference theme. The conference theme draws attention to the increasing evidence that the forces of globalization are having a profound effect on both the process of development and the practices of heritage conservation in this region of the world. While it remains a self-evident article of faith that it is possible to reconcile the imperatives of development and conservation, the credibility of this ideal in practice is under increasing stress on account of many socio-economic forces, not the least being globalization. This conference provides a platform to discuss the many dimensions of this complex process in various parts of the region and the world.

Italy

- CONFERENCE, 2002
Title: Preservation Strategies
From: 25th of June 2002 **To**: 29th of June 2002
Place: Centro Culturale Grand Hotel Dobbiaco
City: Dobbiaco/Toblach (Bolzano Province)
Organiser: Archivo di Stato Bolzano
E-mail contact: asbz.hg@tiscalinet.it
Address: Co-ordination with: Conference Secretary European Commission on Preservation and Access (ECPA) Archivo di Stato PO Box 19121 Via A.Diaz 8 NL-1000 GC Amsterdam 39100 Bolzano
Tel: +31 20 551 08 39, + 39 0471 26 42 95
Fax: + 31 20 620 49 41, + 39 0471 40 71 76
Description: Archival and library institutions are making great efforts to increase awareness of the importance of preservation of documents. A broad survey showed, however, that many public and private institutes do not yet have staff trained in preservation. Preservation covers many activities, from storage to digitisation. Buildings should be well equipped, and the advantages of the new media should be explored. The conference will deal with the many aspects of preservation. The plenary sessions were focused on risk assessment, choices for preservation of originals, scientific research and preservation, substitutes for access, premises and the restoration of historical buildings and parallel sessions on technical and scientific solutions, experience in book and document restoration, migration information, training, networks and access projects.

- CONFERENCE, 2006

Title: Conservation legacies of l'Alluvione. A Symposium Commemorating the 40th Anniversary of the Florence Flood
From: 10 November 2006 **To:** 11 November 2006
Place: Villa La Pietra
City: Firenze

www: http://www.nyu.edu/gsas/dept/fineart/ifa/Florence/florence.htm
Organiser: Conservation Center of Institute of Fine Arts, New York; New York University
Address:
Villa La Pietra and Global Initiatives New York University
Via Bolognese, 120
Firenze 50139
Tel. +39 055 5007 205
Description: The Conservation Center of the Institute of Fine Arts, New York University and Villa la Pietra, New York University, are pleased to invite you to participate in an international symposium commemorating the 40th anniversary of the Florence Flood. "Conservation Legacies of l'Alluvione" will take place in Florence at the Villa la Pietra and Palazzo Vecchio on November 10 and 11, 2006. It will bring together many of the surviving participants in the rescue effort—both the leaders and the so-called "mud angels" who were in the field. They will consider the Flood and its legacy for art conservation and international emergency response in sessions focusing on the development of mass treatments, innovations in conservation materials and techniques, building a network of support for conservation, working with students and the student experience in disaster recovery, and disaster recovery now and in the future.

- INTERNATIONAL SYMPOSIUM, 2006
Title: Archivi sommersi
From: 9 November 2006 **To:** 10 November 2006
Place: Archivio di Stato
City: Firenze
www: http://www.archiviodistato.firenze.it/nuovosito/index.php?id=379
Organiser: Archivio di Stato di firenze
Address:
Auditorium Archivio di Stato
Viale Giovine Italia, 6
50122 Firenze
Tel. +39 055 26 32 01 – **Fax** +39 055 234 11 59

- INTERNATIONAL SEMINAR, 2005
Title: Cultural heritage protection and intercultural dialogue in Kosovo: an experience of cooperation in a post conflict-area
Date: 5 December 2006
City: Roma
www: http://giornateperlacooperazione.it/2005/docs/programma6.pdf
Organiser: Ministero degli Affari Esteri - Cooperazione Italiana per lo sviluppo and INTERSOS
Contact person : Sabrina Bruno
E-mail contact: info@forumsolint.org
Description: Objectives are: to work together for the protection of cultural heritage in Kosovo through cooperation, dialogue and peaceful co-existence; to introduce involved parties and exchange their views on the value of cultural heritage and its protection; to share the experience of a creative combination of different disciplines in a post conflict area where cooperation among conflicting parties leads to revitalizing relationships; to explore the capacity and exchange of information and knowledge on cultural heritage in Kosovo for a possible establishment of a regional experts committee on cultural heritage.

Japan

INTERNATIONAL SEMINAR, 2005
Title: International seminar on the Protection of World Cultural Heritage
From: 13 December 2005 **To:** 16 December 2005
City: Kyoto
www: http://portal.unesco.org/culture/en/ev.php-URL_ID=29323&URL_DO=DO_TOPIC&URL_SECTION=201.html
Organiser: UNESCO and The Research Center for DMUCH, Ritsumeikan University
E-mail contact: f.ichihara@unesco.org
Address:
Research Center for Disaster Mitigation of Urban Cultural Heritage
Aburanokoji-Takatsuji-agaru, Shimogyo-ku
Kyoto 600-8469
Tel. +81 75 353 6133 - **Fax** +81 75 371 0063
Description: This Seminar is being organized as a follow-up to the World Conference on Disaster Reduction which was held in Kobe, Japan, in January 2005. It's main objective is to discuss regional co-operation and a possible programme in the Asia Pacific region. UNESCO's recent activities at World Heritage cultural sites and their future potential on an international level will also be discussed

- INTERNATIONAL MEETING, 2005
Title: ICOMOS-Japan International Expert Meeting on Risk preparedness for cultural heritage in Asia and Circum-Pacific region
From: 15 January 2005 **To:** 17 January 2005
Place: Research Center for Disaster Mitigation for Urban Cultural Heritage (Rits-DMUCH) – Ritsumeikan University
City: Kyoto
www: http://www.heritagerisk.org/icomos/eng.php
Organiser: The Research Center for DMUCH, Ritsumeikan University, Kyoto with support of Japan Foundation and Kyoto Municipal Office in cooperation with ICOMOS Scientific Committee on Risk Preparedness (ICORP) and NPO for the Protection of Cultural Heritage from Disaster
Address:
Research Center for Disaster Mitigation of Urban Cultural Heritage
Aburanokoji-Takatsuji-agaru, Shimogyo-ku
Kyoto 600-8469
Tel. +81 75 353 6133 - **Fax** +81 75 371 0063
Description: The objectives of this meeting are: To develop a Network for risk preparedness initiative in Asia and Circum-Pacific region and also; To bring together sub-regional initiatives in South Asia, South-East Asia etc. for the development of academic programs, training, research, information exchange, exchange of professionals, providing expertise during emergency situations etc.; To address specific risks to cultural heritage in the region. Since most of this region is earthquake-prone, issues concerning earthquake –related risks to cultural heritage can be the focus of discussion. Also the risks that may be attributed to the similarity of materials/techniques of built heritage in the region can also be discussed. In this regard, the meeting will specially draw the focus of participants towards critical risks to the cultural heritage in Kyoto basin from earthquake and fire. The participants in this meeting will also be able to attend the thematic meeting on "Cultural Heritage Risk Management", which is being organized by UNESCO, ICCROM and the Japanese Agency for Cultural

Affairs in Kobe on 19th January 2005. The meeting is organized as a part of the UN World Conference on Disaster Reduction, taking place in Kobe from 18th to 22nd January 2005.

- INTERNATIONAL MEETING, 2005
Title: Cultural Heritage Risk Management
Date: 19 January 2005
City: Kobe
www: http://www.heritagerisk.org/icomos/eng.php
Organiser: UNESCO, ICCROM and the Japanese Agency for Cultural Affairs
Contact person: Kanefusa Masuda
E-mail contact: pfe02120@nifty.ne.jp
Address:
Research Center for Disaster Mitigation of Urban Cultural Heritage
Aburanokoji-Takatsuji-agaru, Shimogyo-ku
Kyoto 600-8469
Tel. +81 75 353 6133 - **Fax** +81 75 371 0063
Description: The meeting will be held on 19th January 2005 as part of the World Conference on Disaster Reduction (WCDR) in Kobe. The main objectives are to adopt a Declaration which urges Member States to integrate risk preparedness planning for cultural heritage sites into overall risk reduction and disaster management policies and strategies at the regional, national and local levels. The adopted Declaration will be integrated into the outcome documents of the World Conference on Disaster Reduction. This meeting will bring together experts from a number of regions of the world to discuss problems faced by cultural heritage professionals when trying to integrate risk preparedness planning for cultural heritage sites into the larger frameworks for risk reduction and disaster management. Case studies will be presented and strategies discussed for international cooperation in this area. Participants will then debate and adopt a declaration to be presented to the Intergovernmental Segment of the Conference, and reflected in the outcome documents of the Conference

- WORLD CONFERENCE, 2005
Title: The World Conference on Disaster Reduction (WCDR)
From: 18 January 2005 **To:** 22 January 2005
City: Kobe and Hyogo
www: http://www.unisdr.org/wcdr
Organiser: The United Nations General Assembly, International Strategy for Disaster Reduction (UN/ISDR)
Address:
United Nations Inter-Agency Secretariat of the International Strategy for Disaster Reduction(UN/ISDR)
International Environment House II
7-9 Chemin de Balexert, CH 1219 Chatelaine,
Geneva 10, Switzerland
Tel. +41 22 917 8908/8907/8849 - **Fax** +41 22 917 8964
Description: The World Conference on Disaster Reduction (WCDR) is a milestone event to increase the profile of disaster risk reduction in development planning and practice. The Conference will provide a unique opportunity to promote a strategic and systematic approach at the national level to address vulnerabilities and to reduce risk to natural hazards. Commitment to the reduction of disasters has been growing although actual materialization is still slow. Human and economic losses due to natural disasters continue to rise and remain as a major obstacle to sustainable development and achievement of the Millennium

Development Goals (MDGs). New risks are emerging. The WCDR is expected to guide and motivate governments and their policy makers to pay more attention to such vital issues, identifying practical ways to incorporate risk reduction measures into action to reduce poverty. The objectives of WCDR are: To conclude and report on the review of the Yokohama Strategy and its Plan of Action, with a view to updating the guiding framework on disaster reduction for the twenty-first century; To identify specific activities aimed at ensuring the implementation of relevant provisions of the Johannesburg Plan of Implementation of the World Summit on Sustainable Development on vulnerability, risk assessment and disaster management; To share best practices and lessons learned to further disaster reduction within the context of attaining sustainable development, and to identify gaps and challenges; To increase awareness of the importance of disaster reduction policies, thereby facilitating and promoting the implementation of those policies; To increase the reliability and availability of appropriate disaster-related information to the public and disaster management agencies in all regions, as set out in relevant provisions of the Johannesburg Plan of Implementation.

Morocco

- INTERNATIONAL CONGRESS, 2004

Title: New Technologies and the Improvement of Greatest Risk Management
From: 15th of March 2004 To: 17th of March 2004
Place: To be confirmed
City: Kénitra
www: www.cnr.ac.ma/lag/colloque2004.doc
Organiser: University Cadi Ayyad; CEPRIS and CNRST
Contact person: Azelarab El Mouraouah and El Arbi Toto
E-mail contact: ceprisrba@cnr.ac.ma and tot@univ-ibntofail.ac.ma
Address: To be confirmed Tel: + 212 61 42 17 52 Fax: + 212 37 77 13 34
Description: The main purposes of this seminar are: to communicate and exchange point of views in risk prevention through specialist analysis and to enforce the partnerships between university , research centres and other actors linked with this sector. The expected results are the formulation of specific proposals from technique and scientific development and the identification of areas upon which scientific efforts should be conducted.

Poland

- INTERNATIONAL CONFERENCE, 2005
Title: Protection of national heritage in case of special threats
From: 27 September 2005 **To:** 29 September 2005
City: Cracow
Organizer: The Fire Service College and State Fire Brigade Headquarters
www: http://www.mk.gov.pl/pcbs
Contact Person: Mr Andrzej Pozierak
E-mail contact: apozierak@sapsp.pl
Address:
College of the State Fire Service
Ul. Zgody 18,
Cracow 31-951
Tel. +48 12 646 0100 – **Fax** +48 12 646 0199

Description: The International Training Center at the Fire Service College in Cracow is an important element of the international system of training specialists and in exchange of experience and coordination of activities in Eastern and Central Europe in terms of protection of cultural heritage.

- INTERNATIONAL CONFERENCE, 2004
Title: Cultural Heritage in view of war and peace-time threats
From: 13 May 2004 **To:** 15 May 2004
City: Warsaw
Organizer: The Polish Blue Shield Committee and UNESCO
www: http://www.mk.gov.pl/pknbt/txt/reports.doc
Description: The purpose of the conference was first and foremost to commemorate the anniversary of the Hague Convention and use the occasion to help shape public awareness of cultural-heritage protection in times of war and peace. Particular prominence was given to a presentation of the legal and organisational solutions in the area of cultural-heritage protection in selected countries. Attention was called to such phenomena has terrorism and cultural conflicts as new types of dangers to the realm of mankind's cultural heritage. The conference organisers' aim was also for the deliberations to become a platform for exchanging experiences in international, regional and local co-operation vis-à-vis contemporary threats to cultural heritage.

Russian Federation

- INTERNATIONAL CONFERENCE, 2005
Title: Heritage at risk: preservation of 20th century architecture and world heritage
From: 17 April 2006 **To:** 20 April 2006
City: Moscow
Organizer: The International Committee for the Conservation of the Industrial Heritage (TICCIH)
www: http://www.mnactec.com/ticcih http://whc.unesco.org/en/events/297/
E-mail contact: mailto:rector@marhi.ru
Address:
Moscow Architectural Institute Rozhderstvenska street 11
Moscow 107031
Tel. 7 095 924 7990 - **Fax** 7 095 924 7990
Description: This conference is organized in co-operation with ICOMOS International, with the support of World Monuments Fund and DOCOMOMO International, the Russian Academy for Architecture and Building Sciences, Russia's UNESCO Commission, Russia's Ministry for Culture and Mass Communications, the Union of Architects of Russia, the Moscow Union of Architects, the Moscow Committee on Architecture and Town-planning 'Moskomarchitektura', the Moscow Committee for the Preservation of Cultural Heritage 'Moskomnasledije', the Schusev Architecture Museum and other national institutions.

Switzerland

- INTERNATIONAL CONFERENCE, 2002
Title: Protection of Cultural Proterty 2002
From: 23rd of September 2002 **To**: 25th of September 2002
Place: Federal Office for Civil Protection
City: Bern

www: http//www.zivilschutz.ch
Organiser: Federal Office for Civil Protection and UNESCO
Contact person: Jan Hladìk
E-mail contact: J.Hladik@unesco.org
Contact person: Rino Büchel
E-mail contact: rino.büchel@bzs.admin.ch
Address: Federal Office Civil Protection Cultural Property Section (KGS) Monbijoustrasse 51A 3003 Bern Tel: + 41 31 322 51 56
Description: The aim is to strengthen co-operation at national level, in particular with relevant offices in the Swiss specialised offices like DFA or DHA. In many countries, protection of cultural property involves only the military sphere. Experience from many conferences has shown that Switzerland could offer an ideal platform to discuss civilian efforts.

- INTERNATIONAL CONFERENCE, 2006
Title: International Disaster Reduction Conference (IDRC)
From: 27 August 2006 **To:** 1 September 2006
City: Davos
www: http://www.davos2006.ch
Organiser: The IDCR Davos 2006 was organized by the Global Alliance for Disaster Reduction (GADR), Global Disaster Information Network (GDIN), United Nations Educational, Scientist and Cultural Organization (UNESCO) and the United Nations International Strategy for Disaster Reduction (UN/ISDR)
E-mail contact: davos2006@slf.ch
Address:
Conference Secretariat IDRC Davos 2006
SLF Flueelastrasse 11
Davos Dorf 7260
Tel. + 41 81 417 0205 - **Fax +** 41 81 417 0823
Description: The purpose of the International Disaster Reduction Conference IDRC Davos 2006, was to push forward the vision of the World Conference for Disaster Risk Reduction held in Kobe, Japan in January 2005 (WCDR 2005) and expand our understanding of what is needed to mainstream and integrate risk management across the various filed. The IDRC Davos 2006 focused the attention of WCDR's priorities, while involving a wider group of risk management practitioners, decision makers, and scientists with a strong emphasis on implementation at "the last mile". The conference in Davos contributed to the UN international strategy for disaster reduction, and strengthened links between participants from different areas of risk management while adding the lesson and new knowledge gained from recent complex disaster such as the December 2004 Tsunami, Hurricanes Katrina, Rita and Stan and the flooding and mudflows in the middle Americas, the earthquake in Pakistan and the threat of avian flu pandemic. The papers have been published in 2006. Proceeding of the Conference have been published in 2005

Trinidad and Tobago

- PRECONFERENCE, 2004
Title: Mitigating the Consequences of Natural Disasters for Caribbean Libraries and Archives
From: 21st of May 2004 **To**: 22nd of May 2004

Place: National Library Building
City: Port-of-Spain
www: http://www.ifla.org/VI/4/conf/20-21may04.htm
Organiser: National Library Building
Contact person: Janice Blake and Shamin Renwick
E-mail contact: jblake@nalis.gov.tt, belbrlib@yahoo.com, srenwick@ttemail.com, srenwick@library.uwi.tt
Address: Adult Library, First Floor National Library Building Hart and Abercromby Streets
Tel: + 1 868 645 4673/5253 or + 1 868 676 7537 **Fax**: + 1 868 662 1392
Description: The purpose of the preconference is to discuss the risks of hurricanes and other natural disasters, how to deal with them and take adequate preventive measures in order to mitigate their consequences. It was expected that attendants weave a network of experts and professionals capable of helping each other in the event of disaster. Around a hundred participants representing various cultural institutions and actors from the civil society were expected from around the Caribbean.

United Kingdom

- CONFERENCE, 2002
Title: Holocene Environmental Catastrophes and Recovery
From: 2nd of September 2002 To: 7th of September 2002
Place: Brunel University
City: London
www: http://www.brunel.ac.uk/depts/geo/Catastrophes/
Organiser: Brunel University
Contact person: Prof. Suzanne A.G. Leroy
E-mail contact: suzanne.leroy@ac.uk
Address: Department of Geology and Earth, Brunel University Uxbridge, Midlesex UB8 3PH, (West London)
Tel: + 44 1895 20 31 78 or + 44 1895 20 32 15 **Fax**: + 44 1895 20 32 17
Description: The conference focused its themes on geological catastrophes and their impact on society, earthquakes, tsunami, fires and volcano eruptions, environmental causes of civilisation collapse, biological impacts on society (extinction, epidemic, plague, haemorrhage, etc. and climatological impacts on society (historical droughts). An informal pre-conference was planned in Scottish Highlands from the 26th to the 31st August 2002.

- CONFERENCE 2007
Title: Responding to Climate Change
A one-day conference organised by the Care of Collections Group of the Institute of Conservation
Date: 25 April 2007
Place: Tate Britain
City: London SW1, United Kingdom
Contact person: Charlotte Cowin
Adress: Icon, 3rd Floor, Downstream Building, 1 London Bridge, London SE1 9BG, UK membership@icon.org.uk
Coordinator: Peter Winsor, Care of Collections Group of Icon

United States

- CONFERENCE, 2002
Title: Lessons Learned in Emergencies: Not your Ordinary Disaster Conference
Date: 21st March 2002
Place: National Archives at College Park
www: http://palimpsest.stanford.edu/byform/mailing-lists/padg/2001/11/msg00016.html
Organiser: NARA
Contact person: Eleanor Torain
E-mail contact: eleanor.torain@nara.gov
Address: NARA 8601 Adelphi Road College Park, MD 20740-6001
Tel: +1 301 713 6718 **Fax**: +1 301 713 6653
Description: The conference brought together archivists, librarians and conservators to discuss the practical aspects of disaster prevention and mitigation. The conference focused on several topics such as, practical, experience-based examples of how emergency situations are handled in archives, libraries, and museums to mitigate against disaster and confusion recovery of non-paper records, such as artefacts, film, audio-video tape, and electronic media; how to minimise the damage to papers, bound volumes, books tapes, films, etc. during building renovation; changes in fire suppression technology; what we have learned from fire tests; how to keep track of hastily removed materials.

- CONFERENCE, 2003
Title: Technology Disaster: Planning for Them and Recovering from Them
Date: 20 June 2003
City: Toronto
www: http://www.ala.org/ala/lita/litaevents/litaannual2003/litaalaannual.htm
E-mail contact: lita@ala.org
Address:
MTCC-Metro Toronto Convention Centre
Tel. +1 800 545 2433 4270 - **Fax** +1 312 280 3257
Description: Topics presented and discussed were about disaster recovery team, disaster recovery plan, minimising the impacts of disaster on the library technology, and the major recovery procedures.

- SEMINAR, 2004
Title: Disaster Preparedness
From: 15th of March 2004 To: 16th of March 2004
Place: The National Cowboy and Western Heritage Museum
City: Oklahoma city
www: http://www.okmuseums.org
Organiser: Oklahoma Museums Association
E-mail: sodaniel@okmuseums.org
Address: Oklahoma Museums Association 2100 NE 52nd Street Oklahoma City - OK 73111
Tel: +1 405 424 7757
Description: This seminar is divided into two parts, the first one was about bare bones of disaster planning and the second one was about post-disaster response. Focused topics involved situation evaluation, damage assessment, media destruction, health and safety issues, and salvage techniques.

Other

- CONFERENCE, 2006
Title: MayDay 2006: Saving Our Archives
www: http://www.archivists.org/mayday/MayDayActivityList.pdf
Organiser: Society of American Archivists (SAA)
E-mail contact: MayDay@archivists.org
Description: Protecting our collections is one of our fundamental responsibilities as archivists. The Heritage Health Index, released in 2005 soon after hurricanes Katrina, Rita, and Wilma struck the Gulf Coast, reported that few institutions have disaster plans and for those that do, often the plan is out of date. It's easy to put off emergency response planning as we devote our attentions to tasks with more immediate "payback." But on May 1 – this year and *every* year – you can do *something* that will make a difference when and if an emergency occurs. That's the purpose of MayDay – a grassroots effort whose goal is to save our archives. MayDay is a time when archivists and other cultural heritage professionals take personal and professional responsibility for doing something simple – something that can be accomplished in a day but that can have a significant impact on an individual's or a repository's ability to respond. Ideas for MayDay Activities: Create or Update Your Contact Lists, Review or Establish Basic Emergency Procedures, Conduct a Disaster Drill, Conduct Scenario Exercises, Invite Your Local Firefighters to Visit Your Repository, Survey the Building for Risks, Make Sure All Collections Are in Boxes, Make Sure Boxes Are Off the Floor, Identify the Most Critical Essential Important Records, Inventory Emergency Supplies and Review Your Emergency Preparedness Plan

VII INTERNATIONAL ORGANISATIONS AND RESEARCH INSTITUTIONS

A. International Organisations related to the Cultural Sector:

- **The International Committee of the Blue Shield (ICBS):** The Blue Shield is the cultural equivalent of the Red Cross. It is the symbol specified in the 1954 Hague Convention for marking cultural sites to give them protection from attack in the event of armed conflict. It is also the name of an international committee set up in 1996 to work to protect the world's cultural heritage threatened by wars and natural disasters. The International Committee of the Blue Shield (ICBS) covers museums and archives, historic sites and libraries. It brings together the knowledge, experience and international networks of the five expert organisations dealing with cultural heritage. For details visit http://www.ifla.org/blueshield.htm

- **ICCROM**: **The International Centre for the Study of the Preservation and Restoration of Cultural Property** (ICCROM) is an intergovernmental organization dedicated to the conservation of cultural heritage. ICCROM aims at improving the quality of conservation practice as well as raising awareness about the importance of preserving cultural heritage. It contributes to preserving cultural heritage through five main areas of activity, namely training, information, research, cooperation and advocacy. For details visit http://www.iccrom.org
  ICCROM, in cooperation with ICOMOS and the UNESCO World Heritage Centre, published Management Guidelines for Risk Preparedness for World Cultural Heritage (H. Stovel 1998). Furthermore, with assistance from the World Heritage Centre, ICCROM developed a set of training materials which have been tested in a number of countries. Risk Management component have also been incorporated into various training programmes (King and Wijesuriya 2008).

- **International Council of Monuments and Sites (ICOMOS):** ICOMOS is an association of professionals throughout the world that works for the conservation and protection of cultural heritage places. It is the only global non-government organisation of this kind, which is dedicated to promoting the application of theory, methodology, and scientific techniques to the conservation of the architectural and archaeological heritage. For details contact; http://www.icomos.org
  ICOMOS members and committees have been developing activities, publications and cooperation to enhance prevention or adapting broad conservation principles to the reality of heritage sites located in risk areas (Bumbaru 2008)

- **The International Union for Conservation of Nature (IUCN):** IUCN helps the world find pragmatic solutions to our most pressing environment and development challenges. It supports scientific research, manages field projects all over the world and brings governments, non-government organizations, United Nations agencies, companies and local communities together to develop and implement policy, laws and best practice. For details, visit; http://www.iucn.org

- **International Council on Museums (ICOM)**

…

Regional Organisations: There are several regional organisations, both inter-governmental as well as non-governmental, which can provide their expertise for the protection of cultural and natural heritage from disasters and also recovering from these.

The Asian Disaster Preparedness Centre (ADPC; www.adpc.org) based in Bangkok and The Asian Disaster Reduction Centre (ADRC; www.adrc.org) in Kobe are two such organisations actively working in the area of disaster management. Cultural Heritage Without Borders (CHwB; http://www.chwb.org/bih) is a Swedish non-governmental organisation, which lends international support to cultural heritage at risk of being destroyed whether as a result of natural disasters, war or neglect because of poverty or political and social conditions. It has been very active in emergency rescue and recovery of cultural heritage damaged due to war in South East Europe.

- **Academic and Research Institutions:** Various institutions are engaged in research and training in this area or related disciplines. One such institution is the Research Center for Disaster Mitigation of Urban Cultural Heritage at Ritsumeikan University in Kyoto, which has started a UNESCO Chair Programme on Cultural Heritage Disaster Risk Management. For details visit http://www.rits-dmuch.jp/en/unesco.html

B. International organizations related to the Disaster Management Sector:

- Where relevant, international and United Nation agencies such as UN Peacekeeping forces, UNHCR and others involved in refugee management.

- Humanitarian agencies and NGOs with emergency support roles in the region (e.g. Medecins Sans Frontières, Flora and Fauna International (Rapid Response Facility)

- World Health Organisation for epidemics; http://www.who.int/csr/delibepidemics/en/

- United Nations Environment Programme Post-conflict and Disaster Branch

- World Meteorological Organisation; http://www.wmo.int

- Food and Agricultural Organisation; http://www.fao.org

VIII WEBGRAPHY

Topic : *Community involvement/ disaster management*

Title	Author	Link
Community involvement in turtle protection / Itsamia-Comoros	Aboubakari Boina	http://www.csiwisepractices.org/?read=59
Expert Meeting on Community Involvement in Safeguarding Intangible Cultural Heritage: Towards the Implementation of the 2003 Convention		unesdoc.unesco.org/images/0014/001459/145919e.pdf
Rehabilitation and Local Capacity Building in the Historic Commercial Centre of Şanlıurfa / Citizens, Experts and Cultural Heritage. Participatory Research and Cultural Heritage as Means of Local Development	Burak Belge, Numan Tuna / Victoria Osuagwu/ Kirsty Norman / Eva Svensson	www.enamecenter.org/downloads/future_of_**heritage**/abstracts_070323_ses2_ENG.pdf
Prioritizing Cultural Heritage in the Asia-Pacific Region: Role of City Governments	Hari Srinivas	
Museum and community involvement: a case study of community collaborative initiatives - National Museums of	Jacob MHANDO NYANGILA	

Kenya		
Descendant Community Involvement in African-American Archaeology in Mississippi: Digging for the Dream in Mound Bayou	Amy L. Young / Milburn J. Crowe	www.uark.edu/campus-resources/archinfo/SHACyoung.pdf
The Roles of Museums in Safeguarding Intangible Cultural Heritage		www.mincultura.gov.co/.../secciones/descargas/documentos_unesco/roles_of_museum_in_safeguarding_pci.pdf
SUSTAINABLE POST DISASTER RECONSTRUCTION THROUGH INTEGRATED RISK MANAGEMENT – THE CASE OF RURAL COMMUNITIES IN SOUTH ASIA	R.Jigyasu	http://www.neduet.edu.pk/Arch_2Jne/Arch11/JRAP-2004/JRAP%204/Revised%20Rohit%20Paper%2019-111.pdf
FROM MARATHWADA TO GUJARAT – EMERGING CHALLENGES IN POST-EARTHQUAKE REHABILITATION FOR SUSTAINABLE ECO-DEVELOPMENT IN SOUTH ASIA	R.Jigyasu	http://www.grif.umontreal.ca/pages/i-rec%20papers/rohit.PDF
TOWARDS A HOLISTIC ECO-DEVELOPMENTAL FRAMEWORK FOR REDUCING VULNERABILITY OF	Rohit Jigyasu	www.erc.gr/English/d&scrn/helsinki-papers/session2/jigyasu.doc

TRADITIONAL RURAL SETTLEMENTS AGAINST EARTHQUAKES IN SOUTH ASIA		
Participatory Approach for Post-Earthquake Reconstruction in the Villages of Kachchh, India	Subhajyoti SAMADDAR* and Norio OKADA	http://www.dpri.kyoto-u.ac.jp/dat/nenpo/no49/49b0/a49b0p20.pdf
Using Traditional Knowledge Using Traditional Knowledge Systems for Post Disaster Systems for Post Disaster Reconstruction	Rohit Jigyasu	http://www.davos2006.ch/Presentations/Jigyasu.pdf
Developing an Archetype for Integrating Native Hawaiian Traditional Knowledge with Earth System Science Education	Barbara A. Gibson/ Noelani Puniwai	http://nagt.org/files/nagt/jge/abstracts/gibsonv54p287.pdf
SAFEGUARDING HAWAIIAN TRADITIONAL KNOWLEDGE AND CULTURAL HERITAGE: SUPPORTING THE RIGHT TO SELF-DETERMINATION AND PREVENTING THE CO-MODIFICATION OF CULTURE	Danielle Conway-Jones	http://www.iipsj.org/IIPSJScholarlyActivities/2005IIPSJHLJSymposium/ConwayJonesHLJArticle.pdf
Protecting Traditional Knowledge and Folklore	Graham Dutfield	http://www.ictsd.org/pubs/ictsd_series/iprs/CS_dutfield.pdf

Topic: *Climate Change*

Titre	Auteur	Lien
Climate change policy and science	Yuko Nishido	www.ias.unu.edu/resource_centre/Yuko%20Nishida.pdf
An assessment of the intergovernmental panel on climate change		www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf
Policy making – a list of publications		http://www.pewclimate.org/global-warming-in-depth/policy/reports
Adaptation to climate change: international policy options		http://www.pewclimate.org/docUploads/PEW_Adaptation.pdf

Topic: *Climate change/Risk management*

Titre	Auteur	Lien
Climate change impacts and risk management	Australian greenhouse office	http://www.greenhouse.gov.au/impacts/publications/pubs/risk-management.pdf
Linking climate change adaptation and disaster risk management for sustainable poverty reduction	Vietnam country study	http://www.climatevarg.org/essd/env/varg.nsf/42ec25f6537f5eff85256dab0048d8e9/b603b3c185bee77485256dab0059aca8/$FILE/EC%20VARG-VietnamStudy.pdf
Climate change and risk management		http://www.ccrm.co.uk/
Disaster risk management in a changing climate		www.unisdr.org/eng/risk-reduction/climate-change/DRM-CC.pdf
Climate change and risk management in Africa: Major issues	Seth D. Vordzorgbe Advisor to the Commission of the Africa Union United Nations International Strategy for Disaster Reduction (UN/ISDR).	http://www.unisdr.org/eng/partner-netw/wb-isdr/docs/Climate_change_and%20risk_management_*in_Africa.doc*
Risk management in water and	*Holger Hoff/ Gerhard Berz*	http://www.germanwatch.org/download/klak/dwc2003.pdf

climate		
Capicity building for climate change	*Milind Kandlikar Ambuj Sagar*	*www.ficci.com/media-room/speeches-presentations/2002/oct/oct-climate-milind.ppt*
Climate change and water resource: the role of risk management	*David C. Major*	*http://www.ucowr.siu.edu/updates/pdf/V112_A8.pdf*
Natural hazards and climate change :Risk management and public policy opportunities	*J.Perkins*	http://quake.abag.ca.gov/mitigation/PR-Climate.pdf
Finanial risk management and climate change		http://www.hm-treasury.gov.uk/media/5/4/climatechange_warwickbusinessschool.pdf
Towards a bank group climate risk management strategy		http://www.wmo.ch/pages/prog/amp/pwsp/documents/Johm.pdf
Climate change, human vulnerability and social risk management	*Rasmus Heltberg/Sten Lau Jorgensen/Paul Bennet Siegel*	http://siteresources.worldbank.org/EXTSOCIALDEVELOPMENT/Resources/SDCCWorkingPaper_SRM.pdf
Climate risk management and agriculture in Austraia and betond		*http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN019485.pdf*
Restoration, preservation and conservation of Egyptian cultural heritage		http://www.cultnat.org/download/Pdfs/part_4/10-Rest.Pres.Cons.%20of%20Egypt%20Cult.pdf
Linking Climate Change Adaptation and Disaster Risk Management for Sustainable Poverty Reduction	*Vietnam Country Study*	*http://www.climatevarg.org/essd/env/varg.nsf/42ec25f6537f5eff85256dab0048d8e9/b603b3c185bee77485256dab0059aca8/$FILE/EC%20VARG-VietnamStudy.pdf*

Topic*: Cultural heritage / risk management*

Risk	David Ball	http://www.arcchip.cz/w04/w04_ball.pdf

management and cultural heritage	and John Watt	
Towards developing methodology gor integrated risk management of cultural heritage monuments and sites	Rohit Jigyasu	http://www.international.icomos.org/xian2005/papers/2-16.pdf
Native title and heritage		http://www.minerals.org.au/__data/assets/pdf_file/0003/12099/Explorers_Guide_to_Regional_ILUA_v1_30_June_06.pdf
Amman, Jordan, Disaster risk management profile		http://emi.pdc.org/cities/CP-Amman-July2006.pdf
European construction technology platform – cultural heritage	ECTP	http://www.ectp.org/documentation/FA-CulturalHeritage-SRA-First%20DraftVersion.pdf
Technologies and community mechanism for civil protection assistance and cultural heritage	GiuFridda/ Lo Tauro	http://www.corp.at/Download/CORP2006_CDRom/archiv/papers2006/CORP2006_GIUFFRIDA.pdf
The city of tomorrow and cultural heritage	David Miles	http://www.sbi.dk/eura/programme/256,1,THE CITY OF TOMORROW AND CULTURAL HERITAGE_Copenhagen, 17 May 2001
Conservation of cultural heritage in Bulgaria and Buffer Zone issues	Hristina Staneva	http://www.law.kyushu-u.ac.jp/programsinenglish/hiroshima/staneva1.pdf
Research for protection, conservation and enhancement of cultural heritage: opportunities for European enterprises	D. Ball/ J.Watt	ftp://ftp.cordis.europa.eu/pub/eesd/docs/ka4_protection_conservation_enhancement.pdf
The cultural heritage and the nature of	Sultan Z. Bakarat	http://crm.cr.nps.gov/archive/23-06/23-06-12.pdf

disasters in Jordan and Palestine		
State of the heritage	The superintendence of cultural heritage	http://www.culturalheritage.gov.mt/filebank/documents/State%20of%20the%20Heritage%20Report%202005.pdf
Istanbul, Turkey disaster risk management profile		http://emi.pdc.org/cities/CP-Istanbul-09-05.pdf
Cultural Considerations for Post Disaster Reconstruction Post-Tsunami Challenges	Teddy Boeni & Rohit Jigyasuii	http://www.adpc.net/infores/newsletter/2005/4-6/TBindo1.pdf
Protection cultural heritage values and places in south east queensland forests	Jane Lennon	http://www.daff.gov.au/__data/assets/pdf_file/0010/49357/qld_se_protect.pdf
Risk Management of cultural assets based on the experience of the great Hanshin Earthquake	Yasumichi Murakami	http://www.nara.accu.or.jp/elearning/2007e-learning/Risk%20Managemant%20of%20Cultural%20Assets.pdf
How Might Climate Change Affect Island Culture in the in the Torres Strait?	Donna Green	http://www.cmar.csiro.au/e-print/open/greendl_2006a.pdf
Disaster management in the the cultural heritage sector : a perspective of international actity from	Graham Mattews	http://www.ifla.org/IV/ifla73/papers/140-Matthews-en.pdf

the united kingdom : lessons and message		
Cultural Heritage and Natural Disasters: Incentives for Risk Management and Mitigation	*June Taboroff*	http://www.crid.or.cr/crid/CD_Inversion/pdf/eng/doc13119/doc13119-contenido.pdf
Climate change and its impact on australian cultural heritage	Michael Pearson	www.aicomos.com/files/michaelpearsonclimatechangepaper.pdf
The protection of cultural landscapes in post-war zones	Zeynep Aygen	http://www.ncl.ac.uk/unescolandscapes/files/AYGENZeynep.pdf

Topic: *Community involvement/ disaster management*

Title Author Link

Community based disaster management in the philippines	Lorna P. Victoria	unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN025912.pdf -
Developing a model for community involvement in post disaster housing programmes	Ali Tolga Özden	http://www.grif.umontreal.ca/pages/OZDEN_Ali%20Tolga.pdf
Draft study oncorporate involvement in disaster management		http://www.wcdr.gfdr.org/imgs/pdfs/Draft_study_of_corporate_involvement_in_disaster_managemen%85.pdf
Social capital and disaster management: building community capacity	Brenda Murphy Holy Dolan	http://209.85.129.104/search?q=cache:d97iSjE_0N4J:info.wlu.ca/~wwwbrant/pages/people/walkerton-first_interima.pdf+community+involvement+disaster+management&hl=fr&ct=clnk&cd=19&gl=fr
Vulnerability and nagement		http://www.mdgbangla.org/poverty/prsp/annex9.doc

The integrated development plan		http://www.buffalocity.gov.za/municipality/idp_pdf/SECTION%20D%20-%20Chapter%2019.pdf
Community based disaster management-trainer's guide		
Sierra Leone disaster management		http://www.daco-sl.org/encyclopedia/4_strat/4_2/sl_disaster_mgt_policy_draft.pdf
Community Based Disaster Management		http://www.faculty.umb.edu/pjt/749-05PBLJC1.doc
Southern Africa Development Community Disaster Management Committee and Technical Seminar		http://www.irgltd.com/Resources/Publications/Africa/2001-01%20SADC%20Disaster%20Management%20Seminar%20Vol%20I-Africa.pdf
SIAM-2, C-4 Component Environmental, Risk and Resource Management-disaster management-Options Regarding Organisational and Physical Location of the Disaster Management Office		http://www.mnre.gov.ws/projects/siam-2/documents/C4%20Component/EMERGENCY%20MANAGEMENT/Disaster%20Management%203a-Discussion%20Document%203%20-%20DMO%20BECA%202005.pdf
International journal of disaster reduction and risk management		http://www.wust.ac.ke/ijournal.pdf
Role of State Government Departments / Agencies in Disaster Management		http://orissagov.nic.in/e-magazine/Orissareview/jan2004/englishpdf/chapter15.pdf

Topic*: Disaster/ risk management*

Title Author Link

30th international conference of the red cross and the red crescent	CICR Geneva	www.ifrc.org/docs/pubs/events/intconf07/28followup-part3-en.pdf

NGO initiatives in risk reduction an annoted bibliography	John Twigg	www.benfieldhrc.org/disaster_studies/ngo_initiatives/NGO_case_studies_bibliog_v12.pdf -
Comparative analysis of disaster risk management practices in seven megacities	Jeannette Fernandezn Fouad Benderimad, Shirley Mattingly, Jim Buika	emi.pdc.org/DRMlibrary/General/Comparative-analysis-DRM-in-7-megacities.pdf -
C Review- the eye of the		www.medicc.org/resources/documents/medicc-review-disaster-management.pdf -
International journal of mass emergencies and disasters	Maureen H. Fordham	www.millersville.edu/~ue/UE_NOV_2001.pdf
World Conference on Disaster Reduction	United nation volunteer	http://dynamic.unv.org/infobase/events/WCDR/Governance.pdf
corporate social responsability and natural disaster reduction: local overview of		www.benfieldhrc.org/disaster_studies/csr/csr_gujarat.pdf
The private sector and the disaster risk management		www.benfieldhrc.org/disaster_studies/csr/csr_overview.pdf