

Recommendations from the Scientific Council Symposium Cultural Heritage and Global Climate Change (GCC)

ICOMOS Scientific Council

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Introduction

At the meeting of the Scientific Council (SC) in Edinburgh, Scotland in September 2006, the SC voted to adopt an interdisciplinary research program on the effects of Global Climate Change (GCC) on heritage. A working group was formed and a brief was circulated in November 2006 to the members of the Scientific Council. Twelve papers were prepared for *Heritage @ Risk*, scheduled to be published in 2008. Of these, five were presented at the scientific symposium¹ that took place on 7 October 2007 in Pretoria, South Africa. An additional paper was presented that focused on maintenance as a method of adaptation.² There were brief summaries of four ICOMOS meetings that dealt with climate change in 2007 prior to Pretoria.³ Breakout sessions during the afternoon explored the question of how GCC affects each International Scientific Committee's (ISC) area of expertise and what adaptation measures should be proposed. 33 people attended the afternoon workshop including seven National Committee members, and the remainder representing 15 of 28 ISCs.⁴ The following are the recommendations from the workshop.

Cultural Heritage and Global Climate Change

The York Factory presentation described the problem for the site as "managing static remains in a dynamic landscape". This is a good description of most conservation work in cultural heritage, whether climate change is involved or not. Climate change accelerates and magnifies the dynamism of the landscape.

Polar Heritage: Climate change affects both the landscape and structures within it. The main observable effect is that elements accustomed to or designed for the cold deteriorate rapidly when the environment warms up. Changes in the landscape result in changes to the setting of a place and may lead to the disappearance of the place altogether (from erosion or loss of foundation rigidity when the permafrost melts).

Earthen Architectural Heritage: Earthen architectural heritage is also greatly at risk. Structures made of mud are often vernacular in nature and hence, very linked to the environmental conditions of their regional context. In addition, mud as a construction material is ephemeral because it has undergone

¹ Introduction: GCC and Its Effects on Cultural Heritage, Pamela Jerome; Coastal Erosion Threatens Arctic Sites, Susan Barr; York Factory, Canada, Marc de Caraffe (with Mell Chapple); New Orleans, Stephen Kelley; and Summer Fires in Greece, Sofia Avgerinou-Kolonias.

² Presented by John Hurd, President of ICOMOS's Advisory Committee.

³ ICORP meeting, New Delhi, Dinu Bumbaru; Regional Meeting in Tahiti, Kristal Buckley; Australia ICOMOS meeting in Cairns, Susan McIntyre-Tamwoy; and Partnership Meeting in Ushuaia, Argentina, Dinu Bumbaru.

⁴ ISCs represented in the breakout sessions included CIAV (Vernacular), CIF (Training), CIIC (Cultural Routes), CIP (Stone), CIVVIH (Historic Towns and Villages), ICAHM (Archaeological Heritage Management), ICICH (Intangible Heritage), ICIP (Interpretation and Presentation), ICOFORT (Fortifications), IFLA (Cultural Landscapes), IPHC (Polar Heritage), ISCARSAH (Structures of Architectural Heritage), ISCEAH (Earthen Architectural Heritage), ISC20C (20th Century Heritage), and TICCIH (Industrial Heritage).

very little modification from its source; therefore, without maintenance it more readily returns to its origins.

Stone: Stone is a material traditionally selected for longevity, based on experience in a particular environment. When climate change alters the environment, the longevity of the material may be seriously reduced. One of the main impacts of climate change is an increase or change in both the wet/dry and freeze/thaw weather cycles, which hastens decay of porous materials including stone. New chemical effects may also occur on significant stone structures previously seen as robust.

Fortifications: For coastal sites, sea level rise is the most obvious impact of climate change. In addition, changing weather patterns, including the increased frequency and intensity of storms, will have an affect. Fortifications such as those in island regions, for instance the Caribbean, are located at water's edge and sea level. These phenomena may also have an accelerated impact on World War II sites that are often constructed of materials such as steel and reinforced concrete that are not naturally durable. Many fortifications inland are built on sites selected for their defensive qualities, and climate change may alter their cultural landscape setting.

Structural Stability: The principles of assessment, diagnosis and treatment of historic structures are largely unaffected by climate change; decay and deterioration phenomenon arising from climate change are reasonably well understood. What will change is the vulnerability of particular structures (due to climate change) to different kinds of problems from the ones they were originally designed to cope with. Examples include timber structures that become vulnerable to termite attack owing to migration of wood-eating insect species; movement of lower level biological growths to follow their ecological niches; and new settlements of structural foundations as the permafrost melts, and clayey soils become wetted or dry out.

20th Century Heritage: The built heritage of the 20th century was characterized by experimentation and innovation in construction materials and techniques, many of which had neither the resilience nor the longevity of traditional construction. Examples include cinder concrete, particleboard, panellised construction, and cladding systems with little redundancy. In addition, the International Style gave little regard to regional context, thereby creating buildings that require massive artificial climate control, which could become unsustainable in a GCC future. Climate change will result in accelerated decay of 20th century structures and there is a need to develop philosophical and practical responses to their conservation.

Archaeological Sites: The physical impacts of climate change on soils, hydrology, chemistry, etc. will affect sub-surface archaeological remains and sites. Site conservation complications caused by "bad" conservation in the past, accelerated by GCC, will be a problem. This includes archaeological excavations that left trenches and sites exposed with little or no conservation, partial walls, etc. There will be an increase in "underwater" archaeological sites, so there is a need to prepare sites for a submerged future. In many countries, there will be literally thousands of archaeological sites that will be submerged or destroyed by wave wash and storm surges over the next several decades. For example in Australia, there are thousands of Aboriginal sites attesting to Holocene (or in some cases earlier) occupation of the continent, as well as important sites that attest to the initial period of European/Aboriginal contact. Most of these sites remain undocumented. It is urgent that countries adopt a strategic approach to the investigation and salvage of information from such sites before it is too late.

Vernacular/Historic Villages and Cities: Professionals need to establish historic context, identify values and significance, and provide an acceptable definition of values. Defining conservation objectives and goals clearly will better express them to the public and help to create awareness. Regional guidelines should be established, areas in danger identified, and gaps in documentation filled. There needs to be a close look at problems of faulty municipal regulations. Architecture follows industrial products, and these are often not environmentally friendly. Urban sprawl is an issue that affects the economics of the environment; if people payed the real price for clean air and safe water, they would not take these for granted. It is important to promote vernacular architecture as energy efficient, as well as socially, culturally and ecologically efficient. The energy efficiency of traditional buildings could be upgraded, but also, the practice of conservation needs to become more "green".

Training: There is an evident need to develop training programs that specifically address climate change problems and adaptation methods. These must be founded on a solid understanding of materials science, so that conservation interventions do not involve materials and methods that will make problems worse in the future.

Cultural Tourism: The slow degradation and/or catastrophic destruction of cultural heritage places and communities, as well as the vast array of natural cultural heritage sites, irrespective of the simple recreational attraction of many places, will have major impacts on the travel patterns and choices available to the 800 million plus international tourists and the countless hundreds of millions of domestic tourists. Apart from the impact on those places that travellers will no longer see as attractive, the increased impact on those that are currently less affected could be significant. Potentially, a vast shift in the existing patterns of activity in one of the world's biggest industries is expected. The tourism industry is beginning to become aware of these issues, but more on the "cause" side than the "effect". The airline industry has begun to look at better-designed aircraft and increased passenger charges to buy carbon-trading offsets. The hotel industry has been embracing environmental sustainability; nevertheless, there are still thousands of hotels and resorts around the world that are deliberately located on marginal land just to exploit dramatic landscape. However, the tourism industry is quite susceptible to ideas and pressure from well-formulated arguments.

Intangible Heritage: The inevitable loss of natural features, flora and fauna will impact cultural landscapes and with it, living traditions. The intangible and tangible heritages are intertwined; impacts from the loss of tangible values affects intangible values. Loss of coastal land will result in the movement of population and industries, which in turn will result in pressure on hitherto un-impacted cultural landscapes and sites. Similarly, there will be population migration from drought-stricken and chronically flooded areas. The increase of urbanization, population movement and relocation will result in loss of traditional caretakers and repair technologies for sites, as well as impact cultural practices.

Cultural Landscapes and Heritage Ensembles: Cultural landscapes and heritage ensembles are vulnerable to climate change, not only through damage to the built or landscaped environment, but also through changes to the natural environment. Desertification of a pastoral landscape, or a mountain landscape cut by landslides and other climate influences can lose meaning as their intangible or spiritual values are non-transferable. Traditional vernacular ensembles are often totally tied into the landscape, both because the construction materials are those readily available in a given region but also because their form may have evolved over centuries as a direct response to the local environment. Archaeological landscapes can also lose value and require greater interpretation because of landscape degradation and flooding. Depopulation and abandonment of living sites is possible as a result of climate change; as their inhabitability becomes untenable, their defining characteristics are at stake. Although heritage bodies and professionals tend to be concerned with individual cultural places, wider cultural landscapes and building ensembles need to be better quantified, documented and prepared for adaptation to the negative impacts of global climate change.

Interpretation: The issue of climatic variation is not just a contemporary one, but is the constant background to all monuments and all of human history. Should interpretive programs about GCC deal primarily with the situation before the recent climatic changes, or should they deal with the current phenomenon of GCC itself, or should they set the current change in context by referring to the history of such change relevant to the site and its location? Interpretation of GCC has two main functions: to report on the current state of conservation, and to report on the current state of research. Yet there is another distinction that is crucial to the reflection of GCC and cultural heritage sites, namely the distinction between information and significance. And if "significance" is to be communicated, what exactly is the significance of GCC? Is there any reason to evade discussion about global responsibility for adapting to climatic change? This could be accomplished in the course of reporting scientific phenomena and their implications, which can vary widely. For instance, a single degree rise in temperature in Costa Rica resulted in the virtual extinction of a particular species of monkeys. The extraordinary heatwave during the summer of 2007 in southeastern Europe not only affected specific monuments but also brought all conservation work to a halt. Changes in climate, such as wind directions in West Ireland during 2007, resulted not only in changed impacts but also impacted on capacity to work in that environment on research and conservation, etc.

Difficult Choices

All of these examples underline an important dimension of GCC as it impacts cultural heritage, namely, that it is often about loss and destruction as much as preservation. In the cases where the loss of cultural heritage resources cannot be prevented or mitigated, its significance actually transforms itself from that of tangible to intangible heritage. Monuments or natural features documented before their destruction become cultural memories. In that respect, the interpretation of GCC-impacted sites cannot restrict itself only to conservation information, but must also attempt to deal with the “why” questions.

The sheer scale of the destruction and threats now being caused by GCC needs to be considered. Priorities must be established to determine which relatively few sites can be saved or protected completely and those in which documentation or archaeological salvage and research can be carried out. This will still obviously leave a great many sites that will be lost forever. Understanding the “vulnerability” of a site will become part of prioritising salvage conservation work. Quantifying what will be affected will enable informed decisions about “what to save”. At present, most work in this area has been *ad hoc* rather than based on a holistic understanding of the range, nature and locations of places which will be affected. Efficiency could be increased through multidisciplinary cooperation.

Should the prioritisation be made on the basis of the rarity of examples? Or on their value as exemplars of certain types of heritage? Or their relative historic importance? Perhaps there may be, in addition to the scholarly and professional evaluations, a matter of local significance and context. A particular site or monument type may be represented by thousands of examples, and thus (at least from the professional perspective), would be relatively well documented and loss would not be catastrophic from a global level. However, since entire landscapes and ecosystems will be affected by climate change, one needs to consider whether or not all of these examples are located in “at risk” environments and, if so, whether they might all be at risk. Simple statements on site type abundance and representativeness need to be revisited with a view to assessing the risk to the landscape and ecosystem.

There is also the danger that GCC impacts and response may be “expert/scientific-driven” imposed upon communities. From the perspective of a local community that has a strong attachment to the site or the monument and the memories that it preserves, its destruction may have serious local social impact, despite the fact that from a professional perspective it was a relatively insignificant heritage site when viewed in objective, taxonomic terms. On the other hand, the professional may need to accept that a cultural heritage site may not be a community’s priority. If there is confidence that decisions are well informed, professionals may need to accept community decisions to abandon or ignore conservation needs. There is a need to provide the resources and programs so that communities can take part equitably in discussions about choices.

Recommendations for Adaptation

Professionals cannot assume that there is a global understanding of GCC. How is knowledge improved or disseminated in the face of political resistance to the acceptance of that knowledge? ICOMOS could pool information from conferences, workshops, etc. and make it accessible online; this might lead to identifying gaps for cultural heritage places. The information should be collated and distilled into digestible information bites. Key documents and case studies need to be translated and made readily available. Local and indigenous knowledge should be integrated into strategies and information databanks. Information and methods could be rolled out through low-cost community workshops. There is a role for cultural heritage in feeding back mitigation strategies for climate change.

Professionals and stakeholders need to keep in mind the historical evolution of cultures to environmental and other changes, so that there is no need to demand static cultural memory, as new emerging cultures lead to new knowledge. Yet, there is still a need to identify a range of places across an area/landscape based on rarity and representativeness, along with other historic, aesthetic, research and community/social/intangible heritage values. These could provide a way of engaging the wider GCC bodies, as well as advocacy to local, regional and national governments and international agencies.

In addition, there is a need for more training for heritage practitioners in the area of GCC that will improve practice and credibility to advocacy, so that they can make more informed inputs on policy. The quality and appropriateness of the information and knowledge used to make decisions must be impeccable and above reproach. Disseminating this knowledge will help clarify the affects to all people who will be impacted. Cultural heritage practitioners must factor in GCC impacts into sustainable management and development plans.

The voice of the community in regards to their space and places needs to be heard in discussions and plans around GCC strategic responses. Anchor points for cultural memory should be evaluated; there is a need to recognize that even after severe impact or loss of place, “memory” needs to be considered. More case studies are necessary in order to propose suitable strategies and responsibilities. The education of heritage practitioners and communities will lead to better decisions and responses.

ICOMOS can have a role to play with the tourism industry’s agenda. Site and destination managers will need to take the potential effects of GCC into their medium- and long-term planning. ICOMOS could identify a range of check-list style questions that could be widely distributed to interested parties raising their awareness of the potential threats that may arise and planting the seeds in their planning processes that encourage them to start preparing for the future.

Practitioners need to understand what is “healthy” cultural heritage. Maintenance is an important factor, but may be irrelevant in cases of rapid, major change; however, in other cases, the slow creep of GCC will require a strong resilience in buildings to cope with insidious and subtle change.

The following “toolbox” is recommended:

Monitoring

Setting up a series of data gathering techniques:

- Air temperature
- RH, internal and external
- Ground temperature – surface
- Ground temperature – minus 1 m
- Ground moisture content
- Monument wall temperature
- Monument moisture content
- Low/high tide marks
- Mobilization of salts
- Proportion of soluble salts
- Quality of water
- Technical data
- Meteorological data (precipitation – amount and pattern, freeze/thaw, maximum/minimum temperatures, wind velocity and direction, altitude)

Research

- Case studies
- Condition assessment, current compared to historic
- Local, regional and international comparative studies
- How is it affecting the populations and intangibles
- Demographics
- Loss of traditional knowledge
- Development of local/regional research strategies to identify potential research questions to drive investigation and salvage of archaeological sites that will be lost as a result of GCC

Maintenance

- Environment
- Maintenance monitoring programs
- Management

Built environment and in use

- Maintain building envelope systems
- Foundations
- Rainwater management
- Wastewater management
- Boundary/building perimeter

Un-conserved archaeology

- Survey and research aimed at identifying the range, nature and location of archaeological sites
- Documentation and recording
- Backfilling
- Shelters
- Shelter coating
- Capping
- Introduction of drainage

Conserved archaeology

- Monitoring
- Research
- Maintenance plan
- Interpretation that explains the relationship of the site to the changing environment, which might also include reference to other sites that have been "lost"

Advocacy

- Prioritisation
- Publication
- Sensitivity and public awareness
- General education
- Government partnerships
- International partnerships
- Regional workshops towards dissemination
- Lobbying
- Outreach to civil society

Training

- Regional workshops for professionals
- Training for specific phenomena changes
- Conferences
- Training of emergency service

Risk Preparedness

- Plan
- Unifying emergency services
- Inspection regimes
- Security types
- Observatories – lookouts (teams of people)
- Mobilize civil society

Conclusion

The heritage of GCC is the heritage of loss, and the significance of that loss must be stressed. Interpretation of GCC must stress both the continual impact of the climate on human culture and the changes occurring today. Clear priorities must be established in determining which GCC sites will be saved. Efficiency in conservation can be increased through multidisciplinary cooperation. Both expertise and local attachment must be considered when setting conservation priorities.