Climate Change and Cultural Heritage

**DURATION:** 2012 – 2013

**TARGET COUNTRIES:** All countries

**PARTNERS INVOLVED:**
- Coordinating centre: CUEBC, Ravello, Italie
- Other Centres: C.R.S.T.R.A, Biskra, Algérie
- Other Partners: Université de Cergy-Pontoise (France), Centre de Recherche et Restauration des Musées de France (Palais du Louvre)

**OBJECTIVES OF THE PROJECT**

**Global objective for 2012-2013:**
Update on current knowledge regarding the impact of climate change and global change on the built cultural heritage (monuments, museums, libraries, archives and storerooms), on towns and cities and urban tourism, through a scientific, political, technical, economic and managerial approach.

**Specific objectives:**

**2012:**
The following points will be covered in detail: climate models and new GIECC scenarios, heritage climatology, impact on the built heritage and towns and cities, rational energy use, impact of tourism on world heritage sites.

**2013:**
Idem

**EXPECTED RESULTS**

**2012:**
High-level training on this subject for science, town planning, engineering, architecture and heritage conservation students.

**2013:**
Idem

**RESULTS OBTAINED PREVIOUSLY**

Between 2009 and 2011, the Council of Europe helped to organise and fund 4 major events on the same theme:

1- An international workshop on "Climate Change and Cultural Heritage" held in Ravello from 14 to 16 May 2009. It attracted 42 participants from 17 countries and international organisations.
2- An initial Master’s/PhD-level course on “Vulnerability of Cultural Heritage to Climate Change” held in Strasbourg from 7 to 11 September 2009. 36 students from 13 countries and 17 lecturers from 7 countries took part.
3- A second Master’s/PhD-level course entitled “Management and Protection of Cultural Heritage. Facing Climate Change” held from 4 to 9 October 2010 in Ravello. It attracted 22 students from 7 countries and 16 lecturers from 8 countries.
4- A third Master’s/PhD-level course entitled “Climate Change, Cultural Heritage and Risk. Energy, Mobility and Access”, which ran from 3 to 7 October 2011 in Ravello, with 24 students from 8 countries and 13 lecturers from 4 countries.

**RESULTS OBTAINED IN 2012**

**Work package 1 (prepared by CUEBC):**

**Description:**
Training planning (contacts with the lecturers, distribution of lectures, etc) - Call for application, announcement

**Associated deliverables:**
Programme of the course and list of applicants

<table>
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<tr>
<th>September 2012</th>
<th>Monday 10</th>
<th>Tuesday 11</th>
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| 9.30-10.45    | - Welcome adress M. Lavandier/M. Menu, C2RMF  
- Introduction C. Sabbioni, co- | -Global Change and Heritage Climatology A. Bonazza | -Climate Change and Indoor Environments D. Camuffo | -Energy requirements of indoor heritage A. Bernardi | -The risk of flooding in Paris and the museums storages |
were 14 September 2012, at the Cultural Heritage, the Council of Europe's Major Hazards Agreement and the University of These issues were cultural or mass. The global changes in society are affecting cultural heritage through large levels. It could also be affected by the increase in the number and intensity of pollution levels (temperature, air humidity, rain, wind, greenhouse gases, etc.) and, in coastal areas, Cultural heritage is affected by climate change not only society itself, through its population and its use of material and energy resources. That is, we have entered a new geological era, the Anthropocene, such as storms, hurricanes, floods, heat waves, droughts, frost, etc. The global changes in society are affecting cultural heritage through large-scale urbanisation, tourism, whether cultural or mass, the use of materials, water scarcity, water and air pollution. These issues were all addressed in the European PhD course run jointly by the European University Centre for Cultural Heritage, the Council of Europe's Major Hazards Agreement and the University of Cergy-Pontoise, from 10 to 14 September 2012, at the Centre de Recherche et de Restauration des Musées de France, in the Louvre. There were 35 students from 9 countries and 14 lecturers from 6 countries.

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<tr>
<th>Time</th>
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<tr>
<td>11.00-12.15</td>
<td>- Impact of Climate Change on Built Heritage and Urban Landscape, C. Sabbioni - Salts Climatology applied to Built Cultural Heritage, B. Menendez - Impact of Global Change on Urban Heritage, M. Cassar - Energy-Natural resources, trends and opportunities, C. Iwaszkiewicz - Visit of the C2RMF Laboratory</td>
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<tr>
<td>15.30-17.00</td>
<td>- Presentation of the practical exercise &quot;Climate Myths&quot; C. Sabbioni A. Bonazza</td>
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**List of lecturers**

Eugenia APICELLA, European University Centre for Cultural Heritage, Ravello, Italy
Adriana BERNARDI, ISAC-CNR Padova, Italy
Alessandra BONAZZA, Institute of Atmospheric Sciences and Climate (ISAC) of the Italian National Research Council (CNR), Bologna-Italy
Dario CAMUFO, ISAC-CNR Padova, Italy
May CASSAR, Director Centre for Sustainable Heritage, University College London (UCL), UK
Michel DEQUE, Météo-France-CNRM
Eric DOEHNE, Université Cergy-Pontoise, France
Eladio FERNANDEZ-GALIANO, EUR-OFA Major Hazards Agreement, Council of Europe, Strasbourg, France
Casimir IWASZKIEWICZ, RES Inbuilt, Kings Langley-UK
Fattoum LAKHDARI, Scientific and Technical Research Centre on Arid Regions, Biskra-Algeria
Roger-Alexandre LEFEVRE, Professeur émérite à l'Université Paris XII, France
Cristina SABBIONI, Institute of Atmospheric Sciences and Climate (ISAC) of the Italian National Research Council (CNR), Bologna-Italy

**Work package 2 (prepared by CUEBC, CRSTRA):**

**Description:**
A 5-day course will be held in Paris at Université de Cergy-Pontoise

**Associated deliverables:**
Training course - documentation (Powerpoint) prepared by lecturers.

Climate change is merely one aspect of the climate change that has been affecting our planet for over two centuries now. This change is a result of the impact of human activity on the environment, with some scientists even suggesting that we have entered a new geological era, the Anthropocene, such is the extent of the changes which humankind has wrought on the planet since it began making large-scale use of energy resources. This global change is not only affecting the Earth’s system, including climate, but is also having a wide impact on society itself, through its population and its use of material and energy resources. Cultural heritage is affected by climate change not only because of the gradual change in climatic parameters and pollution levels (temperature, air humidity, rain, wind, greenhouse gases, etc.) and, in coastal areas, rising sea levels. It could also be affected by the increase in the number and intensity of devastating, violent and relatively brief events such as storms, hurricanes, floods, heat waves, droughts, frost, etc. The global changes in society are affecting cultural heritage through large-scale urbanisation, tourism, whether cultural or mass, the use of materials, water scarcity, water and air pollution.
An initial set of lectures looked at the purely scientific aspects of climate and global change: climate models, heritage climatology (with a practical exercise focusing on "mythical", i.e. notional towns and cities, in a variety of contexts), impact on built urban heritage (including the effect of salt on porous materials and the effects of climate and pollution on glass and stained glass), impact on indoor heritage (museums, libraries, collections, archives, etc.). A second set of lectures looked at the problems presented by energy use for heating, lighting and air conditioning in the same indoor cultural settings, with special emphasis on the pressure that tourism can place on world heritage.

Capitalising on the fact that the course venue, the Louvre, is in the heart of an area of Paris that is on the UNESCO World Heritage List, the potential risks posed by flooding of the Seine for the many monuments and museums (in particular their storerooms) were assessed, along with the strategies designed to safeguard them.

The secretariat of the CUEBC, which had moved for the occasion to Paris, handled the practical arrangements and ensured that the course ran smoothly and that each participant received a copy of the presentations given by the lecturers.

There is no question that, besides the importance and topical nature of the subject-matter and the high calibre of the course, the grants awarded by the Council of Europe together with the financial contribution from the CUEBC and the University of Cergy-Pontoise greatly contributed to the course's popularity with young students of many different nationalities.

**List of Participants**

Alexander ALEXANDROV, Bulgarian Academy of Sciences
Tanya ALEXANDROVA, University of Plovdiv, Bulgaria
Riccardo BERRIOLO, Soprintendenza Speciale per i beni Archeologici di Napoli e Pompei
Umberto CICCARELLI, Rimini, Italy
Mara D'AVINO, Somma Vesuviana, Napoli
Mélanie DENECKER, Université de Cergy Pontoise, France
Maria Concetta DI TUCCIO, University of Milano - CNR-ISAC, Padova, Italy
Monica DI TULLIO, Soprintendenza Speciale per i beni Archeologici di Napoli e Pompei
Alessandra FIASCO, University of Bologna
Stefania GATTO, Napoli, Italy
Josep GRAU-BOVE', London, UK
Vigen HARUTYUNYAN, Wester Survey for Seismic Protection RA; Yerevan State University, Armenia
Vardan HAYRAPETYAN, Wester Survey for Seismic Protection, Ministry of Emergency Situations of the Republic of Armenia
Varsik HAYRAPETYAN, Yerevan State University
Angela LUPPINO, Soprintendenza Speciale per i beni Archeologici di Napoli e Pompei
Irene NATALI, ISAC-CNR
Ivana OSWALDOVA, Faculty of Mechanical Engineering, Czech Technical University in Prague)
Lala RAHMANOVA, Baku - Oxford School
Mandana SAHEB, LISA, UPEC
Dimitra-Makrina SALMANIDOU, Aristotle University of Thessaloniki
Silvia SAVINI, University of Torino
Olga SHASHKINA, Ministry of Environment Protection of Republic of Georgia
Paolo SIANO, Paris, France
Sonya SPASOVA, State University of Library Studies and Information Technologies, Sofia, Bulgaria
Emma TURVEY, University of Lincon, UK
Giovanna VISINTIN, AlmaMater Studiorium, Faculty of mathematical, Bologna, Ita
Nadya VLADIMIROVA, State University of Library Studies and Information Technologies, Sofia, Bulgaria
Gillian WALKER, The University of Reading
Gergana ZAEMDZHIKOVA, Bulgarian Academy of sciences – Forest research institute, Sofia, Bulgaria

**Work package 3 (prepared by CUEBC, CRSTRA):**

**Description:**
Promotion and dissemination of results

**Associated deliverables:**
Newspapers and on-line articles - online publication of proceedings

Copies of all the presentations have been sent to the Executive Secretariat.

**ACTIVITIES PLANNED IN 2013**

**Working package 1 (prepared by CUEBC):**

**Description:**
Training planning (contacts with the lecturers, distribution of lectures, etc) - Call for application, announcement

**Associated deliverables:**
Programme of the course and List of applicants
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