



Scottish Alliance for Geoscience, Environment and Society

PECRE funded exchange to *The Institute of Atmospheric Sciences and Climate of Bologna* in Italy.



(City of Bologna)

An academic visit to the *Natural, Environmental and Anthropic Hazards of Cultural Heritage* research group of The Institute of Atmospheric Sciences and Climate (ISAC) within the larger Italian research institution “*Consiglio nazionale delle Ricerche*” (CNR) took place in Bologna in Italy from the 18th of November till the 4th of January. During this time, the Crespi d’Adda World Heritage Site was also visited where interviews were conducted with managers and experts involved with the heritage site.



(CNR institute in Bologna)

My investigation focuses on the interaction between climate change and cultural heritage. During the time spent at ISAC-CNR I had the chance to obtain feedback on my research from researchers working in European projects investigating climate change impacts on cultural heritage working. I was also able to network with other experts on cultural heritage and climate change from other institutions and universities. In addition, I took the opportunity to consult with managers of heritage sites by interviewing them on topics regarding the assessment of risks and vulnerabilities of cultural heritage to climate change and on adapting cultural heritage to climate change. I was also able to examine the vulnerability of the Crespi d'Adda UNESCO world heritage to climate change. The benefits of this exchange were highly significant for my PhD research in terms of networking and deepening of knowledge on issues related to my research in addition to providing significant results for addressing my research objectives.

My research aims to develop a methodology for assessing the vulnerability of cultural heritage to climate change and also to analyse the adaptation of cultural heritage to climate change taking account the requirement for the preservation of the authenticity of cultural heritage. The opportunity given to me by SAGES with PECRE funding facilitated extended contact with worldwide experts working in climate change and its influence on cultural heritage. This experience widened not only my network of contacts, but also deepened my knowledge of current research investigating climate change impacts and methodologies to assess the vulnerabilities of cultural heritage.

During the time passed at the CNR institute I had the pleasure to meet, interview and get feedback on my research from my hosts, Dr Alessandra Bonazza and Dr Cristina Sabbioni, leading researchers working on European projects focusing on the assessment of climate change risks on cultural heritage.

I was involved in research activities conducted by the members of the staff, for example research conducted on damage function for the estimation of climate change and pollution impacts on marble was demonstrated to me, and a project on the assessment of climate change impacts on cultural heritage performed through a downscaling of climate change projections. The projects currently on-going at the ISAC-CNR focusing on the assessment of the risks and vulnerabilities of cultural heritage to climate change using top-down approaches were also explained to me, and I had the chance to interview members of their team who are conducting work related to my research topics. The staff of the ISAC-CNR shared their knowledge on the investigation of climate change impacts, on the methodologies to assess vulnerability of cultural heritage and on the adaptation of cultural heritage to climate change. The exchange of information and the engagement with the team was beneficial for improving my research and their feedback helped refine further my PhD project.

The collaboration with the ISAC-CNR staff members was also useful for the possibility to learn about other expert's work related to my field, and to contact other experts in cultural heritage preservation and climate change that I was able to interview. This positioned myself in a widened network of expertise and gave me the opportunity to interview other researchers, academics and cultural heritage site managers who helped me to improve my research. I performed additional interviews, travelling in Italy to speak with managers of heritage sites. For example, an interview was conducted with the manager of the "*Opera Primiziale Pisana*", that is preserving the "*Campo dei miracoli*" and so the famous tower in Pisa, another interview was conducted with the director of the institute of arts and cultural and natural heritage of Bologna, and with researchers and academics working in other European and worldwide universities and research centres on climate change impacts on cultural heritage.

After the exchange with the CNR institute, I spent time at the World Heritage Site of Crespi d'Adda. During the visit I interviewed site managers, architects, conservators, natural heritage managers, tourists managers and members of associations involved in the heritage site to be able to understand the implication of climate change impacts for the management of the site. The outcome of the interviews will be analysed with those made at New Lanark in Scotland. It is fundamental for my research looking at how climate change is considered a threat for two different European countries with different climates, understanding the similarities and differences in the management of the sites concerning the preservation versus climate change impacts.



(Crespi d'Adda World Heritage Site)

The collaboration with the CNR institute in Bologna and with the Crespi d'Adda Heritage Site was successful. The benefit of the exchange is reflected in the quality and quantity of information collected and also to the connections made between the institutions involved (CNR, UWS) and with SAGES. There is the potential for future collaboration in other projects possibly involving other SAGES members interested in the topic of climate change and cultural heritage.