

EGU22-2857

<https://doi.org/10.5194/egusphere-egu22-2857>

EGU General Assembly 2022

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



The French monumental heritage in the face of global climate change: state of the art and research perspectives

Roger-Alexandre Lefèvre¹, Peter Brimblecombe², and **Aurélie Verney-Carron**¹

¹LISA, UMR 7583 - CNRS, Université Paris Est Créteil, France (aurelie.verney@lisa.ipsl.fr)

²National Sun Yat-Sen University, Kaohsiung, Taiwan

France's monumental heritage has been the subject of little theoretical research in the face of global climate change, although many applied studies have concerned its adaptation and resilience, especially at the local level. Furthermore, this heritage includes more than 44,000 monuments and classified sites, 48 of which being inscribed on the UNESCO List and therefore deserves to be taken into account in the context of the current climate unbalance.

The complexity lies in the diversity of materials making up the monuments (stones, glass, metals, wood...) and of phenomena that affect them (as well as other constructions). In order to assess the impact of these increasing slow or extreme events already at work, the tools and methodologies range from the description and inventory of the effects, their measurement, mapping and projection into the future using models such as dose-response functions (DRF) with input data from climate models and scenarios. Ancient data can also be used to complement the correlation between climate and heritage, such as dendroclimatology studies of the wood in monuments.

Results from research carried out in France will be presented concerning stone facades, ancient stained glass windows, metals, degradation of walls by salts and dendroclimatology. Further research should focus on the consequences on the monumental heritage of rising marine waters, river and urban flood and low waters, freeze-thaw, the stability of monuments on clay soils and the indoor climate of monuments and their carbon footprint.

In conclusion, much remains to be done in France: (1) complete the inventory and description of the phenomena, their impacts and their location at the national, regional, urban and monumental scales, (2) quantify these impacts in the future via empirical or geochemical models based on climate models outputs.