

Evaluating deterioration of stone-built Cultural Heritage and rock-formed Natural Heritage by means of Non-Destructive Techniques

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Natural and Cultural Heritage conservation is regarded as a priority for humankind, as the UNESCO recognised in the Convention Concerning the Protection of the World Cultural and Natural Heritage in 1972. This convention encouraged to adopt joint policies aiming to give the cultural and natural heritage a function in the life of the community. From the material point of view, both stone-built Cultural Heritage and rock-formed Natural Heritage undergo similar weathering processes and in both cases the use non-destructive techniques to evaluate the effects of weathering is particularly relevant. Non-destructive evaluation techniques do not only allow to respect the integrity of the studied elements, but also allow to make successive repeated measurements in particular points. Repeatability is crucial to understand the evolution of weathering processes and plan preventive conservation strategies. Even more so as changing climate in necessarily affecting the type and extent of weathering processes. This presentation explores a series of existing non-destructive techniques used for the evaluation of weathering/decay, stressing the parallelism between the evaluation of stone decay in built heritage and the assessment of weathering in rock-formed natural heritage. These techniques include morphological evaluation through 3-D digital models, Ultrasound Pulse Velocity determination and Infrared Thermography among others. This presentation will give an overview of how these tools have been used in specific case studies and discuss their advantages and disadvantages for evaluating weathering.

Keywords: Stone decay, Rock weathering , Non-destructive testing