HYPERION - Development of a Decision Support System for Improved Resilience & Sustainable Reconstruction of historic areas to cope with Climate Change & Extreme Events based on Novel Sensors and Modelling Tools

HYPERION aims to introduce a research framework for downscaling the created climate and atmospheric composition as well as associated risk maps down to the 1x1 km (historic area) scale, and specific damage functions for Cultural Heritage (CH) materials. Applying atmospheric modelling for specific Climate Change (CC) scenarios at such refined spatial and time scales allows for an accurate quantitative and qualitative impact assessment of the estimated micro-climatic and atmospheric stressors. HYPERION will perform combined hygrothermal and structural/geotechnical analysis of the CH sites (indoor climate, HVAC, related strains and stresses, etc.) and damage assessment under normal and changed conditions, based on the climatic zone, the micro-climate conditions, the petrographic and textural features of building materials, historic data for the structures, the effect of previous restoration processes and the environmental/physical characteristics of the surrounding environment. The data coming from the integrated monitoring system will be coupled with simulated data (under our holistic resilience assessment platform-HRAP) and will be further analysed through our data management system, while supporting communities' participation and public awareness. The data from the monitoring system will feed the DSS so as to provide proper adaptation and mitigation strategies, and support sustainable reconstruction plans for the CH damages. The produced vulnerability map will be used by the local authorities to assess the threats of CC (and other natural hazards), visualize the built heritage and cultural landscape under future climate scenarios, model the effects of different adaptation strategies, and ultimately prioritize any rehabilitation actions to best allocate funds in both pre- and post-event environments. The project outcomes will be demonstrated to four European historic areas in Norway, Spain, Italy and Greece (representing different climatic zones).

UNIPD Team Leader: Claudio Mazzoli

Department: Department of Geosciences

Coordinator: Institute of Communication and Computer Systems (Greece)

Other Participants:

Ilmatieteen laitos (Finland)

Resilience Guard GmbH (Switzerland)

Oslomet – storbyuniversitetet (Norway)

National Technical University of Athens – NTUA (Greece)

RISA Sicherheitsanalysen GmbH (Germany)

Università degli Studi di Padova (Italy)

Universidad de Granada (Spain)

Aristoteleio Panepistimio Thessalonikis (Greece)

Cy.R.I.C Cyprus Research and Innovation Center Ltd (Cyprus)

Università Iuav di Venezia (Italy)

Vestfold Fylkeskommune (Norway)

Comune di Venezia (Italy)

Dimos Rodou (Greece)

Ephorate of Antiquities of the Dodecanese - Foreia Apchaiotiton Dodekanisoy (Greece)

Ayuntamiento de Granada (Spain)

Diapolitismiko Evro Mesogiakocentro gia tin Unesco (Greece)

Red Spa (Italy)

Total EU Contribution: Euro € 5.997.728,75

Call ID: H2020-LC-CLA-2018-2

Project Duration in months: 42

Start Date: 01/06/2019

End Date: 30/11/2022

Find out more: **https://cordis.europa.eu/project/id/821054**