

Prothego

PROTection
of European Cultural
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from GeO - hazards



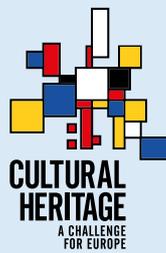
Project Summary

Tangible cultural heritage includes various categories of monuments and sites, from cultural landscapes and sacred sites to archaeological complexes, individual architectural or artistic monuments and historic urban centres. Such places are continuously impacted and weathered by several internal and external factors, both natural and human-induced, with rapid and/or slow onset, including natural hazards, such as earthquakes or extreme meteorological events, cumulative processes as well as the effects of humans, especially in conflict situations. A clear picture of endangered sites is not available; UNESCO, WMF and ICOMOS are providing useful information but only on a limited portion of heritage. New space technology based on radar interferometry is now capable to monitor, since 1992 and with mm precision, surface deformation for reflective targets named persistent scatters (PS), which consistently return stable signals to the radar satellites. The present proposal will apply this new technique to monuments and sites that are potentially unstable due to landslides, sinkholes, settlement, subsidence, active tectonics as well as structural deformation, all of which could be effected of climate change and human interaction. To magnify the impact of the project, the approach will be implemented in more than

450 sites on the UNESCO World Heritage List in geographical Europe. After the remote sensing investigation, detailed geological interpretation, hazard analysis, local-scale monitoring, advanced modelling and field surveying for the most critical sites will be carried out to discover cause and extent of the observed motions. Active engagement of stakeholders from both academic and heritage conservation sectors will be undertaken via establishment of the Steering Committee and Demonstration Site Stakeholders. PROTHEGO will enhance Cultural Heritage management at National level, reinforcing institutional support and governance through knowledge and innovation, identifying, assessing and monitoring risks, strengthening disaster preparedness at heritage properties in the future.

Application and impact

The PROTHEGO project will provide a new remote sensing tool and a new methodological approach, for the safety management of Cultural Heritages, at low cost and covering monuments and sites located in Europe. As a demonstration project, the case studies will refer to the more than 450 UNESCO WHL in Europe. The project will promote interdisciplinary and collaborative R&D activities, transferring the highest level of knowledge, quality and standards



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from space and earth sciences to Cultural Heritage conservation sciences. The idea behind the project is to bring together the different actors in the field of protection of cultural heritage in risky areas (conservators, restorers, architects, archaeologists, engineers, geologists) through an approach that is as much as possible interdisciplinary, by defining a new paradigm of sustainable management and conservation that acts as a catalyst for economic growth of European countries. Regarding the specific topics of the Heritage plus call, the proposed PROTHEGO methodology research will be focused on: long term monitoring systems (with low impact); indirect analysis of environmental contexts, investigating changes and decay of structure, material, landscape of the Cultural Heritage. All the tools developed during the project (e.g. GIS platform,

project web sites, European Hazards database assessment, Guidelines, best practices) will be useful to policy makers (public and private) in the field of Cultural Heritage for correct decision making based on the integrated risk assessment. The innovative use of technologies such as TLS (terrestrial laser scanning) will allow a real three-dimensional reconstruction of the site (useful for modelling) and at the same time the creation of virtual models remotely accessible. The outcomes of the project will be useful to promote a correct planning and the related design issues in order to rebalancing the contrast between endogenous (structural and materials decay, the societal development, the anthropogenic pressure) and surrounding exogenous forces (natural hazards acting on the heritage) which affecting the European Cultural Heritage

Coordinator

Istituto Superiore per la Protezione e la Ricerca Ambientale Geological Survey of Italy (ITALY).

Participants

- Natural Environment Research Council (UK).
- Cyprus University of Technology (CYPRUS).
- University of Milano-Bicocca (ITALY).
- Instituto Geologico y Minero de España (SPAIN).

Dates

01/09/2015 - 28/02/2018

Budget

Total project funding: € € 741.580,00

Funding awarded: € 598.680,00

Subject area(s)

Cultural Heritage, UNESCO, Satellite Interferometry, Natural Hazard, Conservation

Project website

www.prothego.eu