Advancing Resilience of Historic Areas against Climate-related and other Hazards

Resultados

Información del proyecto

ARCH

Identificador del acuerdo de subvención:
820999

Sitio web del proyecto

DOI
10.3030/820999

Proyecto cerrado

Fecha de la firma de la CE
3 Mayo 2019

Fecha de inicio
1 Junio 2019

Fecha de finalización
31 Agosto 2022

Financiado con arreglo a
SOCIETAL CHALLENGES - Climate action, Environment, Resource Efficiency and Raw Materials

Coste total
€ 6 249 962,50

Aportación de la UE
€ 5 999 962,50

Coordinado por
FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV
Germany

CORDIS proporciona enlaces a los documentos públicos y las publicaciones de los proyectos de los programas marco HORIZONTE.

Los enlaces a los documentos y las publicaciones de los proyectos del Séptimo Programa Marco, así como los enlaces a algunos tipos de resultados específicos, como conjuntos de datos y «software», se obtienen dinámicamente de OpenAIRE.

Resultado final

Documents, reports (22)

State-of-the-art reports of concepts, approaches, standards, and technologies

This document will describe the review process employed for conducting the reviews under T7.1 and combine the six ‘state of the art’ reviews into an overall report.

Communication and dissemination strategy

The communication and dissemination strategy will establish the approach and methods of communicating with the project’s target groups and disseminating results. This document will establish the project’s key messages, identify target audiences and define tactics and products to be employed.

Case studies report

This report will gather and analyse the cities experiences and lessons learnt regarding the activities implemented in this project to enhance resilience of historic assets and include the aspects mentioned in T37

Inventory & characterisation report of funding opportunities

The report consists of an inventory of funding opportunities financing models tools and fundraising approaches available from the public and private finance sectors and also from some of the most important financial and public institutions at international European and national levels Specific attention will be paid for the sustainable and ethic social finance opportunitiesIn addition the report classifies the funding opportunities using the applicability requirements considering the foreseen environmental technologic economic social and institutional criteria underlying the value added of the selected options in terms of effectiveness value creation optimised opportunities and minimised risk discussed and approved by the target communities

Report on clustering activities

This document will report on the conducted clustering activities document the project mapping and will also include the joint white paper

CIPCast DSS modification and integration

This deliverable will describe the performed modifications to the CIPCast DSS the data inserted in the DSS and the procedures to prepare the use of the instruments for its adaptation in the pilot city test cases The integration of CIPCast with the ARCH disaster risk management framework will also be described and the subsequent way in which resilienceenhancing strategies could

be evaluated by using the appropriate combination of the two tools and the use of synthetic scenarios

Requirements description

This document will describe the elicited and consolidated user needs and functional as well as non-functional stakeholder requirements from T7.4 and T3.4.5. Due to the agile nature of the co-creation process, new requirements might emerge during the project lifetime. Therefore, D7.5 is a living document that will be updated whenever new requirements are identified.

Report on co-creating the information system

This deliverable will report on the cocreation activities conducted for the historic areas and hazard information management systems Specifically it will report on the conducted local workshops organised to share information obtained by survey campaigns and monitoring activities and to illustrate the functionalities of the information systems It will describe how the workshops were conducted which stakeholders were involved which results were gathered how the results were addressed and which lessons were learned as a result of the process

Mapping and characterisation of experiences and good practices

This document will cover a mapping and characterisation of existing experiences and good practices in Europe and internationally. In addition, it will include the definition of common metrics for experiences and good practices to establish their replicability.

Evaluation report of the ARCH management platform

This deliverable will report on the employed evaluation process How was the evaluation conducted which stakeholders were involved which results were gathered how were the results addressed and which lessons were learned as a result of the evaluation process

City baseline report

This report will summarise the baseline regarding historic areas in the pilot cities including the regulatory framework governance structures the role of the pilot cities in the management of the historic areas expected climate change impacts and environmental hazards and a preliminary assessment of the resilience of the historic areas

Local partnerships & work plan for each pilot city

This report will summarise the results of the stakeholder mapping in each of the pilot cities and include an engagement plan for the project duration. In addition, Each of the pilot cities will develop a work plan for the local activities including timeframe and stakeholders to be involved as well as an overview on the co-creation activities.

Handbook on Heritage Asset Vulnerability

This handbook will describe the developed state indices quality parameters and damage functions and how to employ them for vulnerability assessments of historic areas It will contain amongst others descriptions of interrelation between heritage assets and the social and economic fabric the requirements for ensuring service continuity and the impacts that local economic crises might have on the fate of fragile territories

Digital Twin models for impact assessment

This report will describe the developed and adapted models and methods designed for the impact assessment based on heritage asset and Digital Twin models

ARCH disaster risk management framework

This document describes ARCH's disaster risk management framework for assessing and improving the resilience of historic areas.

Report on co-creating the Impact and Risk Assessment

This deliverable will report on the cocreation activities conducted for the Impact and Risk Assessment and the results obtained For each of the four pilot cities it will include an exante assessment of the historic areas the identification of the analysed crisis scenarios the assessment of the potential damages and impacts on the heritage assets and the resulting exante assessment and the possible crisis evolution when specific strategies and tools identified in the project would have been deployed

Guideline on ARCH co-creation approach

This document will describe the co-creation framework of the project, including a definition of 'co-creation', rules for co-creation (e.g. regular contact, documentation of correspondence / results), frequently encountered obstacles and potential options to address these, as well as employed monitoring techniques (if any).

Standardisation strategy & conducted activities

This document lists the identified potential gaps in the existing standards repository and assesses the project results regarding potential transformation into standards It includes a strategy on how to proceed in terms of standardisation within this project and a review of a workshop conducted with projects funded by the same call assessing the outcomes regarding the integration of further potential tools for the envisaged standardsIn addition this document gives an overview of the conducted standardisation activities the involvement with technical committees the draft CEN Workshop Agreements and the next steps that have to be taken

Hazard models for impact assessment

This report will describe the developed and adapted models and methods designed for the impact assessment based on environmental and heritage asset data

IoT Platform for Digital Twin

This report will describe the architecture of the IoT Platform and how to deliver IoT sensing data to the management system And the protocol and data format of captured data by IoT sensors will be provided

Interface specification and system architecture

This document describes the overall system architecture and definitions of interfaces between the overall system and system components from WPs 4 5 and 6

Assessment of long-term implementation options

Contains a report describing the methodology followed in T62 regarding assessment of the longterm implementation options according to different performance criteria Sustainability resilient economy social and institutional criteria The report will also include the results from the pilot city case studies

Demonstrators, pilots, prototypes (5)

System design, realisation, and integration

This deliverable describes the software produced in T7.6 and the integration process. In addition, it documents the integrated ARCH data and information platform.

Knowledge Information Management System for Decision Support

Reports on the development of the Knowledge Information Management System T4.4, ready for passing integrated data and information (from T4.1, T4.2, and T4.3) to WP5 (T5.1 and T5.2) and WP6 (T6.1 and T6.2) and for integration into the ARCH disaster risk management system in WP7 (T7.6 and T7.7). The prototype provided in this deliverable contains a complete set of technologies developed within WP 4.

Historic Area Information System (HArIS)

Reports on the development of the HArIS from T4.2, formally validated against a sub-set of system specification related to this sub-subsystem, ready for transferring its data to the Knowledge Information Management System (T4.4). The prototype part of the deliverable will be the HArIS. The report will include the user manual.

Sensing and Repositories

Report describing the final version of the technologies developed in T4.1, together comprising the overall repository of sensor data about heritage assets and their environmental conditions, formally validated against a sub-set of system specification related to this sub-subsystem, ready for passing its data to the historic areas and hazards information management systems (T4.2 and T4.3) and for integration into the ARCH disaster risk management system in WP 7 (T7.6 and T7.7).

Threats and Hazard Information System (THIS)

Reports on the development of the THIS from T4.3, formally validated against a sub-set of system specification related to this sub-subsystem, ready for transferring its data to the Knowledge Information management System (T4.4). The prototype part of the deliverable will be the THIS. The report will include the user manual.

Other (2)

Resilience pathway visualisation tool

It consists of a tool to create graphical displays of the designed pathways. It will be accompanied by a manual which explains how to use the tool.The report includes the step-by-step methodology for the resilience pathway design described in an educational way, targeting city stakeholders, and with the aim to support end-users in the definition of resilience pathway for the historic areas. The Handbook will include the co-creation and testing activities results from WP3 as example boxes.

Inventory of resilience options

It will include all the suitable options for historic areas' resilience against hazards, breaking those down in function of when its implementation is expected (before, during, or after the risk appearance), and which will tackle the risk from the four mentioned phases: Preparation, Safeguarding, Conservation & Manage-ment, and Response & Recovery. It will incorporate the detailed characterisation of all the analysed op-tions, and will later be fed by the assessment from T6.2.

Websites, patent fillings, videos etc. (1)

Visual identity, promotional pack, and Website

The visual identity and promotional pack will provide guidance on use of the project's colours, logos, funding acknowledgement and placement of EU emblem

in project outputs, and will provide boilerplate text for communicating the project and its aims for a variety of target groups. The website deliverable document will demonstrate the first version of the ARCH website and will justify the relevant design decisions, as well as detailing future plans for the website's further development as project results become available.

Publicaciones

Other (2)

From Ceramit to Asphalt. Historical Analysis of the Public Space Surfaces in the Center of Bratislava City during the 20th Century.
Autores: Lívia Šišláková, Anna Gondová, Zuzana Zvarová
Publicado en: Man, Building and Urban Planning. Book of Abstracts., Edición 14, 2020, Página(s) 22-23, ISBN 978-80-01-06782-6
Editor: Czech Technical University in Prague

Paving the Way for Climate Neutral and Resilient Historic Districts
Autores: Aitziber Egusquiza; Daniel Lückerath; Saioa Zorita; Sophia Silverton; Gemma Garcia; Emilio Servera; Alessandra Bonazza; Igone Garcia; Antonis Kalis
Publicado en: Open Research Europe, Edición 37, 2023
Editor: Open Research Europe
DOI: 10.12688/openreseurope.15392.1

Peer reviewed articles (20)

The Standardization Process as a Chance for Conceptual Refinement of a Disaster Risk Management Framework: The ARCH Project
Autores: Rene Lindner; Daniel Lückerath; Katharina Milde; Oliver Ullrich; Saskia Maresch; Katherine Peinhardt; Vasileios Latinos; Josune Hernantes; Carmen Jaca
Publicado en: Volume 13, Edición 2, 2021, ISSN 2071-1050
Editor: MDPI Open Access Publishing
DOI: 10.3390/su132112276

Defining a Non-Destructive In Situ Approach for the Determination of Historical Mortar Strength Using the Equotip Hardness Tester

Autores: Elisa Mammoliti; Antonio Ferretti; Michele Malavolta; Riccardo Teloni; Paolo Ruggeri; Graziella Roselli
Publicado en: Applied Sciences, Edición 11(11), 2021, ISSN 2076-3417
Editor: MDPI
DOI: 10.3390/app11114788

Masonry Arch Bridges with Finite Compression Strength Subject to Horizontal Longitudinal Seismic Actions
Autores: Paolo Clemente; Fernando Saitta; Giacomo Buffarini; Chiara Ormando
Publicado en: Applied Sciences, Edición 13(13), 2023, ISSN 2076-3417
Editor: MDPI
DOI: 10.3390/app13137509

Metrics for short-term coastal characterization, protection and planning decisions of Sentina Natural Reserve, Italy
Autores: A. Acciarri, C. Bisci, G. Cantalamessa, S. Cappucci, M. Conti, G. Di Pancrazio, F. Spagnoli, E. Valentini
Publicado en: Ocean & Coastal Management, Edición 201, 2021, Página(s) 105472, ISSN 0964-5691
Editor: Pergamon Press Ltd.
DOI: 10.1016/j.ocecoaman.2020.105472

A Bi-Modal Simulation Model to Increase the Resilience of Public Transit Networks
Autores: Oliver Ullrich; Daniel Lückerath
Publicado en: Simulation Notes Europe, Edición 32(2), 2021, Página(s) 103-112, ISSN 2306-0271
Editor: ARGESIM
DOI: 10.11128/sne.32.tn.10607

Decay assessment of stone-built cultural heritage: The case study of the cosenza cathedral façade (south calabria, italy)
Autores: Antonio Donato; Luciana Randazzo; Michela Ricca; Natalia Rovella; Matteo Collina; Nicola Ruggieri; Francesco Dodaro; Antonio Costanzo; Maria Francesca Alberghina; Salvatore Schiavone; Maria Fabrizia Buongiorno; Mauro Francesco La Russa
Publicado en: Remote Sensing, Edición 13(19), 2022, Página(s) 3925, ISSN 2072-4292
Editor: Multidisciplinary Digital Publishing Institute (MDPI)
DOI: 10.3390/rs13193925

A comprehensive system for semantic spatiotemporal assessment of risk in urban areas
Autores: Alex Coletti, Antonio De Nicola, Antonio Di Pietro, Luigi La Porta, Maurizio Pollino, Vittorio Rosato, Giordano Vicoli, Maria Luisa Villani
Publicado en: Journal of Contingencies and Crisis Management, Edición 28/3,

2020, Página(s) 178-193, ISSN 0966-0879
Editor: Blackwell Publishing Inc.
DOI: 10.1111/1468-5973.12309

A Technological System for Post-Earthquake Damage Scenarios Based on the Monitoring by Means of an Urban Seismic Network
Autores: Antonio Costanzo; Sergio Falcone; Antonino D'Alessandro; Giovanni Vitale; Sonia Giovinazzi; Michele Morici; Andrea Dall'Asta; Maria Fabrizia Buongiorno
Publicado en: Sensors, Edición 21(23), 2021, Página(s) 7887, ISSN 1424-8220
Editor: Multidisciplinary Digital Publishing Institute (MDPI)
DOI: 10.3390/s21237887

Assessment of State Transition Dynamics of Coastal Wetlands in Northern Venice Lagoon, Italy
Autores: Andrea Taramelli, Emiliana Valentini, Laura Piedelobo, Margherita Righini, Sergio Cappucci
Publicado en: Sustainability, Edición 13/8, 2021, Página(s) 4102, ISSN 2071-1050
Editor: MDPI Open Access Publishing
DOI: 10.3390/su13084102

Effectiveness of the “Ecological Beach” Model: Beneficial Management of Posidonia Beach Casts and Banquette
Autores: Alice Rotini, Stefania Chiesa, Loredana Manfra, Patrizia Borrello, Raffaella Piermarini, Cecilia Silvestri, Sergio Cappucci, Luca Parlagreco, Saverio Devoti, Marco Pisapia, Carla Creo, Tiziana Mezzetti, Alfonso Scarpato, Luciana Migliore
Publicado en: Water, Edición 12/11, 2020, Página(s) 3238, ISSN 2073-4441
Editor: Multidisciplinary Digital Publishing Institute (MDPI)
DOI: 10.3390/w12113238

Assessing Earthquake Impacts and Monitoring Resilience of Historic Areas: Methods for GIS Tools
Autores: Sonia Giovinazzi; Corinna Marchili; Antonio Di Pietro; Ludovica Giordano; Antonio Costanzo; Luigi La Porta; Maurizio Pollino; Vittorio Rosato; Daniel Lückerath; Katharina Milde; Oliver Ullrich
Publicado en: ISPRS International Journal of Geo-Information, Edición 10(7), 2021, Página(s) 461, ISSN 2220-9964
Editor: Multidisciplinary Digital Publishing Institute (MDPI)
DOI: 10.3390/ijgi10070461

Use of Satellite Images to Determine the Temperature of Urban Surfaces for Landscape Management Purposes, Case Study Bratislava (Slovak Republic)

Autores: Martin Šalkovič; Eva Pauditšová
Publicado en: Land, Vol 12, Iss 2, p 384 (2023), Edición 21, 2023, ISSN 2073-445X
Editor: MDPI
DOI: 10.3390/land12020384

Co-operating with Municipal Partners on Indicator Identification and Data Acquisition
Autores: Oliver Ullrich, Manfred Bogen, Daniel Lückerath, Erich Rome
Publicado en: SNE Simulation Notes Europe, Edición 29/4, 2019, Página(s) 159-168, ISSN 2305-9974
Editor: ARGESIM Publisher
DOI: 10.11128/sne.29.on.10491

The ARCH Project: Investigating the Impact of Climate Change on Historic Areas
Autores: Daniel Lückerath; Katharina Milde; Oliver Ullrich
Publicado en: Simulation Notes Europe, Edición 16, 2021, Página(s) 53-56, ISSN 2306-0271
Editor: ARGESIM
DOI: 10.11128/sne.31.sn.10561

Co-Creating GIS-Based Dashboards to Democratize Knowledge on Urban Resilience Strategies: Experience with Camerino Municipality
Autores: Maria Luisa Villani; Sonia Giovinazzi; Antonio Costanzo
Publicado en: ISPRS International Journal of Geo-Information, Edición 2, 2023, ISSN 2220-9964
Editor: MDPI
DOI: 10.3390/ijgi12020065

Assessment of the Anthropogenic Sediment Budget of a Littoral Cell System (Northern Tuscany, Italy)
Autores: Sergio Cappucci, Duccio Bertoni, Luigi Enrico Cipriani, Gianfranco Boninsegni, Giovanni Sarti
Publicado en: Water, Edición 12/11, 2020, Página(s) 3240, ISSN 2073-4441
Editor: Multidisciplinary Digital Publishing Institute (MDPI)
DOI: 10.3390/w12113240

Effects of Anthropic and Ambient Vibrations on Archaeological Sites: The Case of the Circus Maximus in Rome
Autores: Luca Maria Puzzilli; Giovanni Bongiovanni; Paolo Clemente; Vincenzo Di Fiore; Vladimiro Verrubbi
Publicado en: Goesciences, Edición 11(11), 2021, ISSN 2076-3263
Editor: MDPI
DOI: 10.3390/geosciences11110463

Application of UAS in Forest Firefighting for Detecting Ignitions and 3D Fuel Volume Estimation

Autores: Krukowski, Artur; Vogiatzaki, Emmanouela
Publicado en: World Academy of Science, Engineering and TechnologyInternational Journal of Biological and Ecological Engineering, Edición 14(11), 2020, ISSN 0000-0000
Editor: Zenodo
DOI: 10.5281/zenodo.4291150

Urban Seismic Network Based on MEMS Sensors: The Experience of the Seismic Observatory in Camerino (Marche, Italy)

Autores: Vitale, Giovanni, Antonino D'Alessandro, Andrea Di Benedetto, Anna Figlioli, Antonio Costanzo, Stefano Speciale, Quintilio Piattoni, and Leonardo Cipriani
Publicado en: Sensors, Edición 22(12), 2022, Página(s) 4335, ISSN 1424-8220
Editor: Multidisciplinary Digital Publishing Institute (MDPI)
DOI: 10.3390/s22124335

Lessons Learned from Applying Adaptation Pathways in Heatwave Risk Management in Antwerp and Key Challenges for Further Development

Autores: Mendizabal, M.; Peña, N.; Hooyberghs, H.; Lambrechts, G.; Sepúlveda, J.; Zorita, S.
Publicado en: Sustainability, Edición 20711050, 2021, Página(s) 11481, ISSN 2071-1050
Editor: MDPI Open Access Publishing
DOI: 10.3390/su132011481

Book chapters (2)

Local Geology and Seismic-Induced Damages: The Case of Amatrice (Central Italy)

Autores: Sergio Cappucci, Giacomo Buffarini, Ludovica Giordano, Salomon Hailemikael, Guido Martini, Maurizio Pollino
Publicado en: Computational Science and Its Applications – ICCSA 2020 - 20th International Conference, Cagliari, Italy, July 1–4, 2020, Proceedings, Part II, Edición 12250, 2020, Página(s) 950-962, ISBN 978-3-030-58801-4
Editor: Springer International Publishing
DOI: 10.1007/978-3-030-58802-1_68

Climate Change Impact and Vulnerability Analysis in the City of Bratislava: Application and Lessons Learned

Autores: Daniel Lückerath, Eva Streberová, Manfred Bogen, Erich Rome, Oliver Ullrich, Eva Pauditsová

Publicado en: Critical Information Infrastructures Security - 14th International Conference, CRITIS 2019, Linköping, Sweden, September 23–25, 2019, Revised Selected Papers, Edición 11777, 2020, Página(s) 83-94, ISBN 978-3-030-37669-7
Editor: Springer International Publishing
DOI: 10.1007/978-3-030-37670-3_7

Conference proceedings (9)

Applying Simulation to Advance Resilience of Historic Areas to Climate Change and Natural Hazards
Autores: Katharina Milde, Sonia Giovinazzi, Daniel Lückerath, Oliver Ullrich, Maurizio Pollino, Erich Rome, Vittorio Rosato
Publicado en: Proceedings ASIM SST 2020, Edición 59, 2020, Página(s) 453-460, ISBN 9783901608933
Editor: ARGESIM Publisher Vienna
DOI: 10.11128/arep.59.a59063

Autonomous Aerial Systems in Service of Cultural Heritage Protection from Climate Change Effects
Autores: Artur Krukowski and Emmanouela Vogiatzaki
Publicado en: International Euro-Mediterranean Conference (EuroMed2020), Edición 8th, 2020
Editor: UNESCO (organizer) & Springer (proceedings)
DOI: 10.5281/zenodo.4269654

Protection of Cultural Heritage against the Effects of Climate Change Using Autonomous Aerial Systems Combined with Automated Decision Support
Autores: Krukowski, Artur; Vogiatzaki, Emmanouela
Publicado en: Journal of Construction Materials, Edición 2, 2021
Editor: Zenodo
DOI: 10.36756/jcm.v2.3.6

Specification of the planning process of adaptation urban areas with historic objects to climate change
Autores: Eva Pauditšová, Eva Streberová, Daniel Lückerath, Katharina Milde, Kilian Nickel, Anna Gondová, Margareta Musilová, Erich Rome, Oliver Ullrich, Ingrid Konrad, Manfred Bogen
Publicado en: 2020
Editor: Adapt Northern Heritage Conference

The Pavement Handbook for the Bratislava City Historic Areas - Contribution on How toMake the Heritage Cities More Resilient in the Era of Climate Change.

Autores: Anna Gondová, Lívia Šišláková
Publicado en: 2020
Editor: University of Kent

Bringing Research on City Resilience to Relevant Stakeholders – Combining Co-creation and Standardization in the ARCH project
Autores: Lindner, René; Lückerath, Daniel; Hernantes, Josune; Jaca, Carmen; Latinos, Vasileios; Peinhardt, Katherine
Publicado en: Proceedings of the 26th International Conference on Urban Planning, Regional Development and Information Society, Edición 38, 2021, Página(s) 133-141, ISBN 978-3-9504945-0-1
Editor: REAL CORP
DOI: 10.48494/realcorp2021.0104

Sensing in Service of Cultural Heritage Protection from Negative Effects of Climate Change
Autores: Artur KRUKOWSKI, Emmanouela VOGIATZAKI
Publicado en: Sensors Technologies International conference 2021 (Sensors'2021), 2021
Editor: SETCOR (www.setcor.org)
DOI: 10.5281/zenodo.6806263

Towards Increasing Resilience of Public Transit Infrastructure – A Bi-Modal Simulation Model
Autores: Daniel Lückerath; Oliver Ullrich
Publicado en: ASIM 2022 Proceedings Langbeiträge, 26. Symposium Simulationstechnik, 2022, Página(s) 81-89, ISBN 978-3-901608-97-1
Editor: ARGESIM
DOI: 10.11128/arep.20.a2015

Specification of the planning process of adaptation urban areas with historic objects to climate change
Autores: Eva Pauditšová, Eva Streberová, Daniel Lückerath, Katharina Milde, Kilian Nickel, Anna Gondová, Margareta Musilová, Erich Rome, Oliver Ullrich, Ingrid Konrad, Manfred Bogen
Publicado en: Adapt Northern Heritage Conference 2020, 2020
Editor: Adapt Northern Heritage Conference

Conjuntos de datos

Conjuntos de datos vía OpenAIRE (3)

Dataset for Crack Detection in Images of Bricks and Masonry Using CNNs

Autores: Krukowski, Artur
Publicado en: Zenodo

DS.RFSAT.ENV-SENSORS
Autores: Krukowski, Artur
Publicado en: Zenodo

DS.RFSAT.OBJECT-3D-SCANS
Autores: Krukowski, Artur
Publicado en: Zenodo

Otros productos de investigación

Otros productos de investigación a través de OpenAire (5)

A comprehensive system for semantic spatiotemporal assessment of risk in urban areas
Autores: Coletti A.; De Nicola A.; Di Pietro A.; La Porta L.; Pollino M.; Rosato V.; Vicoli G.; Villani M. L.

A technological system for post-earthquake damage scenarios based on the monitoring by means of an urban seismic network
Autores: Costanzo A.; Falcone S.; D'alessandro A.; Vitale G.; Giovinazzi S.; Morici M.; Dall'asta A.; Buongiorno M. F.

Effects of Anthropic and Ambient Vibrations on Archaeological Sites: The Case of the Circus Maximus in Rome
Autores: Luca Maria Puzzilli; Giovanni Bongiovanni; Paolo Clemente; Vincenzo Di Fiore; Vladimiro Verrubbi

Assessment of the anthropogenic sediment budget of a littoral cell system (Northern tuscany, italy)
Autores: Cappucci S.; Bertoni D.; Cipriani L. E.; Boninsegni G.; Sarti G.

Sensing in Service of Cultural Heritage Protection from Negative Effects of Climate Change
Autores: krukowski, Artur; Vogiatzaki, Emmanouela
Publicado en: Zenodo

Última actualización: 27 Marzo 2023