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ProCulTher-NET 2
PROTECTING CULTURAL HERITAGE
FROM THE CONSEQUENCES OF DISASTERS - NETWORK

TECHNICAL BULLETIN

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TECHNICAL BULLETIN

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Technical Bulletin

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How to protect cultural heritage at risk - The Hungarian National Museum's pilot projects for CPP, Lujza Varga, PhD, Head of Department, Hungarian National Museum Public Collection Centre, Hungary

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Fire in the Church of the Holy Trinity of Segovia (Spain): from response to recovery - an incident/disaster can be small... losses never are, Cristina Gomez Gonzalez, Territorial Culture Service/UGRECYL Territorial Cell, Segovia and Cristina Escudero Remirez, UGRECYL Central Unit, Junta de Castilla y León, Spain

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THE PROJECT



PROCULTHER-NET 2
PROTECTING CULTURAL HERITAGE
FROM THE CONSEQUENCES OF DISASTERS - NETWORK

PROCULTHER-NET 2 is co-funded by the Directorate-General for European Civil Protection and Humanitarian Aid Operations - DG-ECHO under the European Union Civil Protection Mechanism - UCPM, and implemented by a Consortium led by the Italian Civil Protection Department (Italy) in collaboration with the Ministry of Interior-Disaster and Emergency Management Authority - AFAD (Türkiye), the German Archaeological Institute - DAI (Germany), the *Ministère de l'In-*

térieur - Direction Générale de la Sécurité Civile et de la Gestion des Crises (France), the *Fondazione Hallgarten - Franchetti Centro Studi Villa Montesca*, the Ministry of Culture and Tourism of the Region Government of Castilla y León (Spain), the Federal Agency for Technical Relief - THW (Germany), the University of Porto - UPORTO (Portugal) and the Suor Orsola Benincasa University - UNISOB (Italy).

Building on the experience and lessons learnt by the previous PROCULTHER EU-funded initiatives implemented under the framework of the Union Civil Protection Knowledge Network- UCPKN, PROCULTHER-NET 2 aims at implementing the pathway mapped out by the PROCULTHER-NET project to consolidate the inclusion of the protection of cultural heritage at risk in the Union Civil Protection Mechanism - UCPM processes and structures, so as to increase disaster preparedness capacities and knowledge at European and national levels.

The ongoing phase, running from January 2024 to December 2025, moves forward to consolidate and further expand the thematic community on the protection of cultural heritage at risk established within the UCPKN, namely for defining elements for its sustainable governance and functioning.

Join the KN and find out more on **PROCULTHER-NET!**



FOREWORD

By Fabrizio Curcio, Head of the Italian Civil Protection Department-Presidency of the Council of Ministers

As project coordinator of PROCULTHER-NET 2, I am delighted to introduce the new issue of the technical bulletin. This publication, alongside forthcoming issues, is designed to meet the growing demand for risk-informed approaches and to promote the cross-fertilization of technical and operational expertise essential for enhancing the protection of cultural heritage at risk.

The significant contributions featured in this issue highlight a paradigm shift occurring at the European level. However, the path towards the achievement of full recognition of cultural heritage protection as an integral part of civil protection is still long and PROCULTHER-NET is fully engaged towards the fulfilment of this objective. Indeed, it is no coincidence that all technical contributions stress the critical need to strengthen coordination among cultural heritage and disaster risk management actors and sectors.

The PROCULTHER-NET 2 goals were set to identify capacities, address needs and drive technical and technological innovation. Therefore, the knowledge presented lays the groundwork for fostering collaboration across cultural heritage, disaster risk management, scientific, research, humanitarian, military, and technology sectors pertaining to cultural heritage protection.

Moreover, the co-financing of initiatives, such as this one, by the Union Civil Protection Mechanism reaffirms its commitment to reinforcing cooperation among EU countries and the ten participating states on civil protection. Advancing the role of the Union Civil Protection Knowledge Network is pivotal for sharing knowledge and improving prevention, preparedness, and response efforts to reduce risk of disasters.

In the name of all of the Italian Civil Protection Department, we take pride in contributing to this significant achievement, which strengthens capacity-building processes, by leveraging the great potential for resilience inherent in cultural heritage to sustainably reduce the vulnerability of our communities at risk. For this reason, we express our sincere gratitude to all countries, cultural heritage and disaster risk management institutions, experts and reviewers, who are devoting their efforts to this important knowledge-sharing process.

We encourage you to make the most of this technical bulletin and engage with the PROCULTHER-NET community to further our collective goals.



INTRODUCTION

By Editorial Committee

Building on the foundations laid by PROCULTHER-NET, this third edition of the Technical Bulletins offers cultural heritage and disaster risk managers a new selection of articles on the protection of cultural heritage from the effects of disasters.

In order to contribute to enhance a broad and diverse thematic community on cultural heritage in crisis – one of the objectives of the Union Civil Protection Knowledge Network (UCPKN) – a Europe-wide call for contributions was launched for this issue through the UCPM Focal Points and the PROCULTHER-NET 2 network. This led to the opening of the Technical Bulletins to countries outside the project's Consortium. We are pleased to welcome articles from Hungary and Slovakia, as well as contributions from France, Germany, Italy, and Spain.

A new review system has been introduced to improve replicability and knowledge transfer. Following acceptance of a short concept note, authors were invited by the Editorial Board to submit a full article for review by at least two experts with complementary backgrounds. The reviewers were identified through the networks of the Consortium Partners, mostly outside their own organizations, thus further broadening the thematic community. We would like to warmly thank the reviewers from France, Germany, Italy, and Portugal, but also from Albania, Lebanon, and the USA for their constructive feedback.

The 3rd issue of the Technical Bulletin opens with two articles dedicated to **PREVENTION**. The SiLK Guidelines, a German online tool, is aimed in particular at small and medium-sized cultural organizations. Based on lessons learned from past disasters, this self-assessment tool contributes to raising awareness of the risks and hazards that threaten cultural heritage.



The field exercise during the PROCULTHER-NET training course, March 2023 © DPC

A concrete application of risk assessment tools and awareness-raising communication is offered by the Department of Cultural Heritage of the University of Bologna, which has implemented the SIRIUS project. Using the city of Ravenna as a case study, it assessed the territorial risks to the local cultural heritage and sought to develop a “risk culture” among the general public, with a focus on young people.

From data interrelationships to capacity building and public awareness raising: the Ravenna (Italy) example and SIRIUS Project- management strategies for cultural heritage at risk

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Over the past few decades, the idea of risks affecting cultural heritage has gradually changed from post-World War II protection concerns and single-event response plans to the need for a managerial approach and integrated assessments.¹ More recently, prioritisation strategies in museums that combine preventive conservation of collections with the use of risk management cycles have emerged, providing the opportunity to incorporate risk assessment procedures, in a more thorough way, in site-planning activities.² Today, a variety of measures are being implemented by Nations around the world to protect cultural assets against disaster threats, based on the relevant conventions, regulatory frameworks, and recommendations.³ International disaster risk reduction frameworks, as the Sendai Framework for Disaster Risk Reduction and the Hyogo Framework for Action, acknowledge the connections between different aspects of culture, risk reduction, and resilience. Aside from having a significant impact on sustainable development, poverty reduction, and economic prosperity, cultural heritage can contribute to the resilience of impacted

¹ Jokilehto J., *Iccrom's Involvement in Risk Preparedness*. In: *Journal of the American Institute for Conservation*. 2013 (39): 173-179. Accessed 22 May 2024. [<https://doi.org/https://doi.org/10.1179/019713600806113275>]

Matiz Lopes P.J., *Integrated risk assessment for cultural heritage sites: a holistic support tool for decision-making*. Lucca: University of Lucca, 2016. [http://e-theses.imtlucca.it/195/1/Matiz_phdthesis.pdf]

² Michalski S., Pedersoli J.L., *The ABC Method: a risk management approach to the preservation of cultural heritage*. Ottawa: Canadian Conservation Institute, 2017. Accessed 5 July 2024. [https://www.iccom.org/sites/default/files/2017-12/risk_manual_2016-eng.pdf]

Tandon A., *Endangered heritage: emergency evacuation of heritage collections*. Paris: UNESCO, International Centre for the Study of the Preservation and Restoration of Cultural Property, 2016.

³ UNESCO, *Convention Concerning the Protection of the World Cultural and Natural Heritage*, (1972). [<https://whc.unesco.org/en/conventiontext/>]

Preventionweb. 2005. *Kyoto declaration 2005 on Protection of cultural properties, historic areas and their settings from loss in disasters*. Accessed 22 May 2024. [<https://www.preventionweb.net/publication/kyoto-declaration-2005-protection-cultural-properties-historic-areas-and-their-settings>]

populations in post-disaster scenarios. Therefore, international frameworks offer supportive policy environment for mainstreaming disaster risk management to protect cultural heritage assets.

The paper discusses the methodological approach and preliminary results obtained within the SIRIUS project- strategies for the management of cultural heritage at risk.⁴ Led by the Department of Cultural Heritage of the University of Bologna, the project foresees a local adaptation of the recommendations promoted at an international level on disaster risk management, using the city of Ravenna as a case study. The project started in 2021 with the activation of a research line addressing the territory's needs. For the first two years of implementation, SIRIUS was supported by Fondazione Flaminia and the Municipality of Ravenna and, in 2023, it was integrated in the PNRR PE05 CHANGES "Cultural Heritage Active Innovation for the Next-Sustainable Society project. The team currently consists of three associate professors, two full professors, two junior assistant professors, and one post-doc from the University of Bologna. SIRIUS aims to support local bodies and institutions in improving the procedures for monitoring, preventing, and mitigating the risks to which cultural heritage is vulnerable, by developing cross-sectoral approaches and encouraging cooperation among disaster risk managers, cultural heritage actors, and knowledge holders to increase the resilience of civil society. The project intervenes in three areas: collection and interrelation of data on territorial risks; capacity building and knowledge transfer; communication and awareness raising among citizens.

Action 1. Toward a Risk Atlas linking data on territorial risks and cultural heritage

In order to further understand the territorial risks affecting the Ravenna area and how they relate to cultural heritage, the SIRIUS team, the Municipality of Ravenna, and the Territorial Office of Civil Protection collaborated closely to facilitate the collection and interrelation of pre-existing data.

A localised Risk Atlas was set-up as a preliminary, interoperable tool. It is a WebGIS platform that provides an overview of the natural hazards affecting the Ravenna area, specifically related to cultural heritage. The fundamental concept is derived from the "Carta del Rischio"⁵, an information system that offers administrative and scientific support to state and agencies tasked with protecting cultural heritage asset, The Risk Atlas, on the other hand, is set up as a locally scaled tool, which enables local operational bodies to consider the risks that affect Ravenna's region with greater precision.

Geodata from the WebGIS of the Cultural Heritage of Emilia-Romagna area, which

⁴ Alma Mater Studiorum Università di Bologna. 2024. RESTART-RESilienza e Sviluppo Territoriale: patrimonio A Rischio e Tutela. Accessed 22 May 2024. [<https://site.unibo.it/resilienza-patrimonio-culturale/it>]

⁵ Ministero della Cultura, Istituto Centrale del Restauro. 2004. Carta del Rischio. Accessed 22 May 2024. [<http://www.cartadelrischio.beniculturali.it/login>]

was created in 2012, when a severe earthquake occurred⁶, were used to map Ravenna's cultural heritage. Each cultural asset in the Risk Atlas is marked by a circular placeholder featuring a summary file that links up to the Ministry website, "Vincoli in Rete".⁷ For the data collection of territorial risks, the starting point was an in-depth analysis of the Municipal Civil Protection Plan of Ravenna.⁸ The Plan states that Ravenna, which is home to 98 buildings of historical interest and 8 monuments listed on the UNESCO Cultural Heritage List, is vulnerable to a wide range of risks, including those related to flooding, seismic activity, subsidence, heat waves, forest fires, transport of hazardous goods, electrical blackouts, industrial accidents. Although the Municipal Civil Protection Plan indicates cultural heritage as one of the most "relevant elements" in Ravenna's territory, a dedicated intervention strategy is still not in place.

Working in synergy with the Territorial Office of Civil Protection, the decision was made to focus on flooding, subsidence, and earthquakes because these were the main territorial risks that could be further explored through open, exportable, and interoperable datasets using the WebGIS system.

For the risk of flooding, the collection of data relating to the Ravenna area was carried out through the public portal of the Emilia-Romagna Region "Portale minERva".⁹ The collaboration with the Territorial Office of Civil Protection also allowed the retrieval of the most recent cartography available on the "2019 Floods Directive", an act of the European Commission for the prevention and management of flood risk, reviewed by the Emilia-Romagna Region through a co-participatory initiative in 2021.¹⁰ For the purposes of the project, the hazard maps relating to the Ravenna area were used, which show the areas presumably affected by floods according to three risk scenarios:

- a) low probability of floods or "extreme events" (P1, low hazard);
- b) infrequent floods (P2, medium hazard);
- c) frequent floods (P3, high hazard).

⁶ Di Cocco I., Dalla lista dei danni alla mappa del tesoro. La creazione del database e dell'archivio cartografico GIS come opportunità per conoscere, organizzare, gestire il patrimonio culturale dei territori colpiti dal sisma. In: C. Di Francesco (Ed.), *A Sei Mesi Dal Sisma. Rapporto Sui Beni Culturali in Emilia-Romagna*. Bologna: Minerva Soluzioni Editoriali srl, 2014.

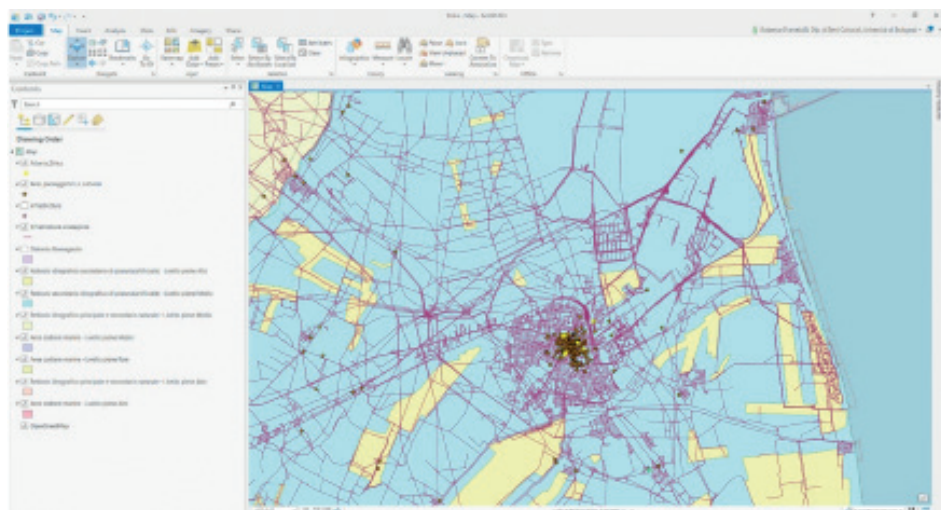
⁷ Ministero della Cultura. 2012. *Vincoli in Rete*. Accessed 21 May 2024. [<http://vincoliinrete.beniculturali.it/VincoliInRete/vir/utente/login>]

⁸ Comune di Ravenna. 2023. *Piano Protezione Civile Comunale*. Accessed 22 May 2024. . [<https://www.comune.ra.it/aree-tematiche/protezione-civile/piano-di-protezione-civile-comunale/>]

⁹ Regione Emilia-Romagna. 2017. *Portale minERva*. Accessed 21 May 2024. [<https://datacatalog.regione.emilia-romagna.it/catalogCTA/>]

¹⁰ Regione Emilia-Romagna. 2022. *Moka DIRETTIVA ALLUVIONI*. Accessed 2 May 2024.. [<https://servizimoka.regione.emilia-romagna.it/mokaApp/apps/DA/index.html>]

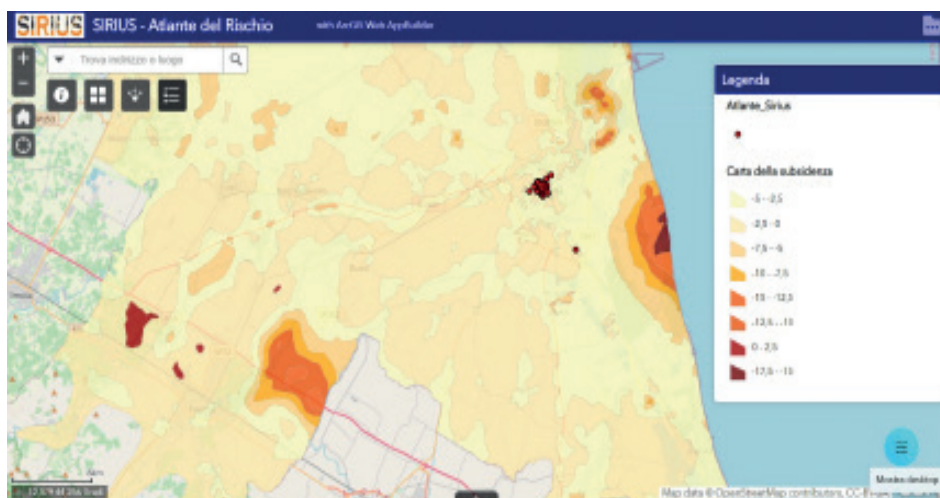
When the mapping of the components of cultural heritage is compared to the cartography related to the hydraulic risk, it is clear that they are all exposed to this risk factor (see image 1).



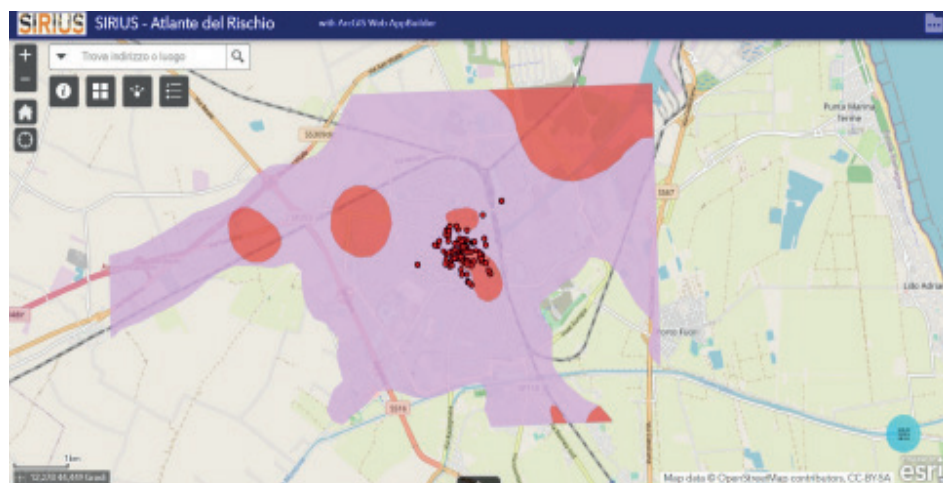
1. Screenshot from ArcGIS Pro Risk Atlas: maps of the areas of Ravenna that are at risk of flooding (light blue areas indicate lowland secondary hydrographic networks with medium flood levels and yellow areas indicate lowland secondary hydrographic networks with high flood levels), combined with the location of culturally significant sites (orange dots and yellow stars for UNESCO sites) © ALMA MATER STUDIORUM - University of Bologna, 2024

Data and technical reports related to subsidence were gathered through the public portal of ARPAE, the Emilia-Romagna Energy and Environment Prevention Agency¹¹, while subsidence maps were available on the “MinERva Portal”. Data show a trend towards stability of the phenomenon that historically affects the Ravenna area, currently estimated at - 2.5mm/year. By superimposing the geolocation of cultural heritage with the subsidence maps, every mapped cultural site is located in the area of the phenomenon's relative stability (see image 2, p. 22).

¹¹ Regione Emilia-Romagna. 2017. Rilievo della subsidenza nella pianura emiliano-romagnola: prima fase. Accessed 21 May 2024. [<https://ambiente.regione.emilia-romagna.it/it/acque/norme-documenti/documenti/rilievo-della-subsidenza-nella-pianura-emiliano-romagnola/monitoraggio-2011-2016-prima-fase>]. See also: Regione Emilia-Romagna. 2018. Rilievo della subsidenza nella pianura emiliano-romagnola: seconda fase. Accessed 21 May 2024. [<https://ambiente.regione.emilia-romagna.it/it/acque/approfondimenti/documenti/rilievo-della-subsidenza-nella-pianura-emiliano-romagnola/seconda-fase>]



velocity in the integration interval 0.5-1.0 s, highlighted two areas of higher localized instability near sites of cultural interest (see image 3).



3. Screenshot from the Risk Atlas created with the ArcGIS Online Web AppBuilder: level III seismic micro-zonation cartography with amplification factor calculated as Housner intensity in pseudo velocity in the integration interval 0.5-1.0s (FH0510) and location of the Ravenna cultural heritage. The areas with higher localized instability are marked in red © ALMA MATER STUDIORUM - University of Bologna, 2024

The interrelation of collected data showed that, from the standpoint of territorial risks, a uniform and stable situation affects the cultural heritage components. The Risk Atlas also highlights that, according to territorial risk maps, the potentially highest hazard for cultural heritage located in the city area is natural flooding. The analysis of the seismic micro-zoning maps also shows that cultural heritage insists on a low seismic territory; however, the geology of the soils demonstrates how localised liquefaction events could develop in a so-called “worst case” scenario, posing a risk to the population and the region’s historic heritage.

Action 2. Capacity building and knowledge sharing on cultural heritage at risk

Today cultural heritage is still not adequately taken into account when planning for disaster risk management, and it is still common practise to not include dedicated protection measures in national, regional, or local risk management strategies.¹⁵ As far as the

¹⁵ Spennemann D.H.R., Cultural heritage conservation during emergency management: luxury or necessity?. *International Journal of Public Administration*. 2007(22):745-804. See also: Graham K., Spennemann D.H.R., State emergency service local controllers’ attitudes towards disaster planning for cultural heritage resources. In: *Disaster Prevention and Management*. 2006, vol. 15, issue 5 :742-762.

Italian scenario is concerned, actions in the ordinary care and management of cultural and natural heritage are supervised by the Ministry of Culture, which acts through the Superintendencies, peripheral bodies of the Ministry with direct responsibilities on the local territory. In the event of a disaster, the Department of Civil Protection is given precedence for intervention. Locally, the Municipal Civil Protection Plan defines the operating procedures used by the Civil Protection Department, working in collaboration with the National Fire and Rescue Service, the Armed Forces, the State Forestry Corps, the National Technical Services, the National Scientific Research Groups, the Italian Red Cross, the National Health Service, and voluntary associations. Although actions and measures on cultural heritage are described in detail in directives valid on the national territory¹⁶, they refer primarily to recovery and safety interventions following the emergency event. There is, therefore, the need for cross-collaboration among all the operators called to intervene when emergencies arise on a local scale.

To meet this requirement by developing a constructive process of capacity building and knowledge transfer at a local level, the SIRIUS project is developing training sessions on cultural heritage management and risk intervention, using the national guidelines as a point of reference.¹⁷ To strengthen the role that cultural heritage can have as a tool for resilience and recovery from catastrophes, this project action works in tandem with the *RESTART-REsilienza e Sviluppo Territoriale: patrimonio A Rischio e Tutela* project,¹⁸ which was recently launched in response to the flood events that affected the Emilia-Romagna area in May 2023. The training foresees participation from local government officials and organisations in charge of intervening in emergency

¹⁶ Ministero della Cultura. 2016. *Direttiva del 12 settembre 2016 prot.11807 recante "procedure di rimozione e recupero delle macerie di beni tutelati e di edilizia storica"*. Accessed 22 May 2024. [<https://www.beniculturali.it/comunicato/direttiva-del-12-settembre-2016-prot-11807-recante-procedure-di-rimozione-e-recupero-delle-macerie-di-beni-tutelati-e-di-edilizia-storica-rettifica-data-protocollo-dg-abap-servizio-iii>] See also: Ministero della Cultura. 2023. *Decreto del Dipartimento della Protezione Civile 13 dicembre 2023 -Indicazioni operative per la gestione delle macerie a seguito di evento sismico*. Accessed 22 May 2024. [https://dgspatrimonioculturale.beniculturali.it/wp-content/uploads/2024/02/Decreto-Dipartimento-Protezione-Civile-13_12_2023-Indicazioni-operative-per-la-gestione-delle-macerie-a-seguito-di-evento-sismico.pdf]

¹⁷ Ministero della Cultura. 2020. *Circolare SG n. 22, 26 marzo 2020 - Gestione coordinata delle attività di messa in sicurezza e salvaguardia del patrimonio culturale in occasione di eventi derivanti da calamità naturali. Specificazioni*. Accessed 22 May 2024. [https://dgspatrimonioculturale.beniculturali.it/wp-content/uploads/2020/08/Gestione-attivit%C3%A0-messa-in-sicurezza-e-salvaguardia-patrimonio-culturale-per-calamit%C3%A0-naturali-SG-Circolare-N.-22_26_03_2020.pdf] See also: Ministero della Cultura. 2016. *Direttiva DG-APAB 12 agosto 2016 - Procedure di rimozione e recupero delle macerie di beni tutelati e di edilizia storica*. Accessed 22 May 2024. [https://dgspatrimonioculturale.beniculturali.it/wp-content/uploads/2020/08/Procedure-rimozione-e-recupero-macerie-beni-tutelati-e-edilizia-storica-Direttiva-DG-ABAP-12_08_2016.pdf]

¹⁸ Alma Mater Studiorum Università di Bologna. 2024. *RESTART-REsilienza e Sviluppo Territoriale: patrimonio A Rischio e Tutela*. Accessed May 22, 2024. [<https://site.unibo.it/resilienza-patrimonio-culturale/it>]

situations, in addition to academics and university students. The objective is to foster capacity building and knowledge sharing to collaboratively operate in the prevention, management, and mitigation of threats impacting on cultural heritage. In terms of capacity building, a first pilot action was carried out within an educational laboratory targeted to students enrolled in the bachelor's degree programme in Cultural Heritage. An interactive, co-participatory activity based on "inSIGHT - a participatory game for enhancing disaster risk governance" was developed, that allowed participants to share and put their experiences into practise (see photo 4). inSIGHT was conceived in the framework of ICCROM's flagship programme on First Aid and Resilience for Cultural Heritage in Times of Crisis, and its capacity building project on Culture Cannot Wait: Heritage for Peace and Resilience.¹⁹ Combining theoretical knowledge with a practical learning method through risk scenario surveys, proved to be a significant experience from the "capacity building" perspective for professional experts who will work with cultural assets in the future. Thirty-one students, twenty to twenty-two years old, enrolled in the second year of the Cultural Heritage bachelor degree participated in the activities thus far. The workshop focuses on the topic of management and reduction of risks that threaten cultural heritage, in line with the international strategies and ac-



4. Projects prepared by students in Cultural Heritage during the inSIGHT simulation © Sara Fiorentino

¹⁹ Tandon A., Chmutina K., *inSIGHT: A Participatory Game for Enhancing Disaster Risk Governance*. Rome: ICCROM, 2020.

tion plans. The aim is to increase awareness on the ways in which cultural and natural heritage can mitigate natural and anthropic risks, thus reinforcing its position as a crosscutting element in the pursuit of sustainable development goals. Regarding the impact and results achieved, 75% of the workshop attendees observed that the topics covered were helpful in acquiring new skills in the Cultural Heritage risk management approach; 100% of participants indicated their will to learn more on the subject, and the same positive feedback emerged for the cooperative activities, found to be stimulating while also lowering the workload by a better distribution and teamwork.

Action 3. Promoting a “risk culture” through public engagement and awareness raising

To support the development of a comprehensive risk culture addressing everything, from the effects of human and natural hazards on individuals to the effects on cultural assets, SIRIUS aims at providing awareness-raising activities for a range of age groups, with a focus on young citizens.

The activity “I-CARE: Together for the Communication of the Cultural Heritage at Risk of Ravenna” was carried out in 2023 as part of the annual proposal for Pathways for Transversal and Orientation Skills, a project of the Italian Ministry of Education compulsory for all students in the last three years of high school. Involving a group of students from Ravenna’s Classical Studies Lyceum Dante Alighieri, I-CARE promoted collaborative and creative activities aimed to increase the civic values of young people and offer conceptual tools for the identification of potential risks impacting on cultural and natural heritage as well as encourage an active participation in the process of CH protection. The participants were stimulated to combine, in an attractive and communicative way, information and data on cultural heritage at risk. The students’ projects were shared with Ravenna’s residents during the European Researchers’ Night in 2023. Among them, the podcast “Racconti dall’Esarcato” deserves to be mentioned. Consisting of four episodes, it features the voices of high school students who relate stories about significant locations in Ravenna. The fundamental concept is straightforward, yet incredibly intuitive and expressive: the first step to comprehending and safeguarding the places we live in is learning about their past and memories.²⁰ Previously, in 2021, another initiative promoting active citizenship was an interactive exhibition on cultural heritage at risk named “Under a lucky star: together for protecting cultural heritage”. The event, framed within the European Researchers’ Night, aimed to inform and raise public awareness on the risks threatening our cultural heritage, with a focus on Ravenna. All related materials produced from Story Maps to videos, are accessible to the public on the SIRIUS project website.²¹

²⁰ Liceo Classico Statale Dante Alighieri di Ravenna. 2023. *Racconti dall’Esarcato. Un podcast su Ravenna, per Ravenna*. Accessed 31 May 2024. [<https://sites.google.com/view/raccontidallesarcato/home>]

²¹ Alma Mater Studiorum Università di Bologna. 2022. *Sotto una buona stella. SIRIUS-Strategie per la gestione del patrimonio culturale a rischio*. Accessed 22 May 2024. [<https://site.unibo.it/patrimonioculturalerischio/it/sotto-una-buona-stella>]

SIRIUS has also collaborated with Unijunior, the first example of a children's university in Italy, for the co-design of an Educational Laboratory for children aged 8 to 12.²² The Laboratory aimed to encourage children's engagement with the subject of cultural heritage at risk through games and interactive activities. Cooperative learning exercises and instructional games were conducted under the guidance of facilitators to familiarise children with the causes and effects that natural and man-made hazards can have on cultural assets. From a long-term perspective, these kinds of activities seek to help children better understand the potential effects that unfavourable events may have on their habitat, while also preparing them to respond more responsibly in an emergency situation.

Conclusions and further developments

To actively support, the implementation of management strategies for cultural heritage at risk, SIRIUS will continue working on the three planned lines of action in the coming years. In a more comprehensive scenario, such an approach will contribute to enhance knowledge and bridge those operational practise gaps identified by the state of the art. Regarding Action 1, SIRIUS is currently scaling up the ABC method, developed by ICCROM and CCI for museum collections, on the UNESCO monuments of Ravenna to prioritise the risk agents potentially affecting cultural heritage. By using the ABC method to determine the impacting risks' magnitude, it will be possible to prioritise and rank the risks based on the severity of the potential impact and required mitigating actions. Further attention is paid to the data management integrated in the Risk Atlas, by working to provide adequate accessibility and transparent interoperability. Through the implementation of cross-sectoral and co-creative workshops, Action 2 will foster capacity building and knowledge sharing to intervene in the prevention, management, and mitigation of threats on cultural heritage. Last, prospects for Action 3 development envision the establishment of a proper "risk culture" among citizens, as well as the promotion of a more active role in safeguarding cultural assets, with specific attention to young citizens and participatory activities at an urban level by developing dedicated data models and a risk assessment ontology.

²² Unijunior. 2024. Unijunior. Conoscere per Crescere. Accessed 31 May 2024 [<https://www.unijunior.it/>]