



**STRENgthening resilience of Cultural Heritage at risk  
in a changing environment through proactive  
transnational cooperation**



**NEWSLETTER #3  
MAY-OCTOBER 2021**



The EU Interreg Central Europe project **STRENCH** develops ready to use solutions for assessing climate change effects and protecting cultural heritage & cultural landscapes.



European Union  
European Regional  
Development Fund

Dear Reader,

we are pleased to provide you with the 3<sup>rd</sup> STRENCH newsletter covering the project duration May-October 2021 presenting the following topics to you:

🌱 **Project Progress Q2 & Q3 2021**

Visit our Webpage: <https://www.interreg-central.eu/Content.Node/STRENCH.html>

And follow us on Facebook: <https://www.facebook.com/Strench.InterregCE/>

🌱 **STRENCH Summer School held from June 7<sup>th</sup> to June 11<sup>th</sup> 2021**

🌱 **STRENCH Conference held on June 10<sup>th</sup> 2021**

🌱 **Definition of a methodology for ranking vulnerability of cultural heritage (D.T.1.1.2)**

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🌱 **Spotlight & Focus: WebGIS tool – tutorial for user friendly transfer**

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**ITALY, 16th September 2021 – walk for the European Researchers' Night FVG CNR**

**Hungary, 28th September 2021 - Preparing for the effects of climate change and protecting our natural and cultural heritage LBDCA**

**Austria, 28th April 2021 – Fostering cooperation for cultural heritage protection during natural disasters (DUK & SISTEMA)**

**Germany, September 16th 2021 - STRENCH Local Working Table – Year 2, District Administration Forchheim**

🌱 **STRENCH Promo-Video Onsite Filming Completion**



## STRENCH Summer School held from June 7th to June 11th 2021

Joint ENVIMAT and  
Cultural Property Protection  
Summer School 2021

7<sup>th</sup> to 11<sup>th</sup> June 2021 | online  
Risk Management and Protection Strategies for Cultural Landscapes  
in Climate Change

Danube University Krems.  
Department for Building and Environment.  
[www.donau-uni.ac.at/dbu/summerschool](http://www.donau-uni.ac.at/dbu/summerschool)

Held from June 07<sup>th</sup> to 11<sup>th</sup> 2021 the one-week program focused on climate change related challenges to landscapes and historic parks, vulnerability assessment and preventive conservation measures for natural and cultural heritage as well as risk management and protection strategies for cultural heritage.

### Short summary:

- 🌱 Online hosted via Zoom, in English language, no course fee.
- 🌱 6 ECTS points were granted for full participation and work performed in the syndicate working groups & case studies.
- 🌱 A total of 39 participants (incl. lecturers) attended the lectures of the Summer School 2021 and actively participated in the syndicate working groups & case studies.

With a dense 5 day program the STRENCH Summer School 2021 laid its main focus on “*Risk Management & Protection Strategies for Cultural Landscapes in Climate Change*”. In this regard each course day was given a specific focus. Monday June 7<sup>th</sup> Introduction & Climate Change Challenges. Tuesday June 8<sup>th</sup> Vulnerability & Preventive Conservation. Wednesday June 9<sup>th</sup> Risk Assessment & Management. Thursday June 10<sup>th</sup> STRENCH international Conference. Friday June 11<sup>th</sup> Case Studies - Syndicate Working Groups & Closure.

Monday June 7<sup>th</sup> 2021: Dr. Anna M. Kaiser, Danube University Krems, Center for Cultural Property Protection, Austria (Host). As primary spokesperson of the Danube University Krems and Host of the joint ENVIMAT and Cultural Property Protection Summer School 2021 “*Risk Management & Protection Strategies for Cultural Landscapes in Climate Change*” Ms. Kaiser initiated the Summer School 2021 by welcoming all participants and lecturers with a presentation on the STRENCH Interreg Project followed by an overview of the program before handing over to Alessandra Bonazza from CNR-ISAC to commence with the first lecture.

Alessandra Bonazza, STRENCH Project-Lead, Institute of Atmospheric Sciences and Climate (CNR-ISAC), Italy, initiated the series of lectures of the SU 2021 with an hour-long presentation on the “*Climate Change Challenges to Cultural Landscapes: Impacts and Approaches for Protection*”.



Subsequently transitioning to Stefano Natali, Managing Director Sistema GmbH, Austria, an expert on remote sensing analysis techniques for environmental monitoring & satellite-collected data who elaborated on the topic of “Exploring Copernicus Program for Safeguarding Cultural and Natural Heritage at Risk” paving the ground for the content presented by Alessandro Sardella, Institute of Atmospheric Sciences and Climate (CNR-ISAC), Italy, who continued with a lecture on the “WebGIS Tool for Multi-Risk Assessment of Cultural and Natural Heritage”

Following the first day’s presentations the lecturers continued to supervise the participants who had decided to participate in the Syndicate Working Groups on Case Studies with a Focus on Climate Change Challenges. Those participants who choose to join the Syndicate Working Groups were expected to select a pilot site (potentially from their country of origin and/or of which they had substantial knowledge of) and to apply the presented information on this site. The various groups were allocated in a matter to ensure a degree of diversity whilst maintaining synergies within the chosen sites aiming to enhance the experience of the participants. The groups composition was maintained for the duration of the course.

Tuesday June 8th 2021: After the first day’s focus on Climate Change Challenges the second day of the SU 2021 laid its focus on Vulnerability and Preventive Conservation by starting with a presentation by Miloš Drdácý, Institute of Theoretical and Applied Mechanics, The Czech Academy of Sciences (ITAM), Czech Republic, on the “Impact of natural and man-made Threats on Cultural Heritage”.

His colleague Riccardo Cacciotti, Institute of Theoretical and Applied Mechanics, The Czech Academy of Sciences (ITAM), Czech Republic, continued with a presentation on the “Vulnerability Assessment for Cultural Heritage Protection” before handing the word back to Miloš Drdácý who elaborated on the “Resilience Preparedness of Cultural Heritage against natural and man-made Disasters”.

As with the first day of the Summer School 2021 both lecturers continued their work together with the participants of the Syndicate Working Groups on Case Studies focusing on aspects of Vulnerability & Preventive Conversation.

The day was concluded with an evening lecture on the “Valorisation and Conservation of Underwater Cultural Heritage: Challenge and Perspective” by Michaela Ricca of the University of Calabria, DiBest, Italy.

Wednesday June 9th 2021: On the 3rd day of the SU 2021 the thematic focus was laid on the Risk Assessment and Management of Cultural Heritage. Starting with a lecture on “Assessing Threats and Managing Risk for Cultural Heritage” by Dr. Anna M. Kaiser, Danube University Krems, Center for Cultural Property Protection (Host) laying the basis for Christine Rottenbacher’s, Center for Environmental Sensitivity, Danube University Krems, Austria, presentation on “Self caused Climate Change in our Cultural Landscapes: How to assess Vulnerabilities of our Landscapes with Rapid Scoring Tools”. Anna Kaiser then continued to support the Syndicate Working Groups on Case Studies focusing on Risk Assessment & Management.



The day was closed with an evening lecture “Spotlight Cultural Property Protection, Host Nation Fort Drum: Protecting Cultural Landscapes in Northern NY” by the ever so wonderful Ms. Laurie Rush, US Army 10th Mountain Division, Fort Drum, USA.

Thursday June 10th 2021: The fourth day of the SU 2021 was incorporated into the 1st International STRENCH Conference: “Strengthening Resilience of Cultural Heritage at Risk in a Changing Environment”, giving the participants a unique insight into state of the art cultural heritage protection agendas tailored towards the expected threats posed by the ongoing climate change.

Friday June 11th 2021: The final day of the SU 2021 was concluded by a presentation of all case studies of the participants of the Syndicate Working Groups. Feedback for the participants and final words were provided by Alessandra Bonazza, STRENCH Project-Lead, Institute of Atmospheric Sciences and Climate (CNR-ISAC), Italy.

In Conclusion:

Of the 39 participants (incl. lecturers), who attended and actively participated in the Summer School 2021, 5 earned a 6 ECTS Certificate based on their work performed in the syndicate working groups throughout the SU 2021 and for the final presentations given on Friday June 11th.

All lectures as well as additional literature were uploaded to the Moodle-Platform which remains accessible for all participants.

The lectures themselves as well as practical sessions were well received by the participants with positive feedback given verbally at the end of lectures and courses. A subsequent online survey of the participants regarding their satisfaction of the SU 2021 showed that 81,3 % stated that they were “highly satisfied” with the SU 2021. When asked of their favorite topic presented at the SU 2021 (in reference to the official program) the answers given were spread broadly with a marginal favorite being “Climate Change Challenges to Cultural Landscapes”. Thus the variety of topics chosen for presentation and lecturing during the SU 2021 reflect a well balanced and liked content-mix regarding “Risk Management & Protection Strategies for Cultural Landscapes in Climate Change”.

**PROGRAMME (Time is CEST)**

**MONDAY, 07 JUNE 2021**

- 0900-0930 Introduction to STRENCH and the Summer School (CNR-ISAC & DUK)
- 0930-1030 Climate Change Challenges to Cultural Landscapes: Impacts and Approaches for Protection  
Alessandra Bonazza, CNR-ISAC
- 1030-1130 Exploring Copernicus Programme for Safeguarding Cultural and Natural Heritage at Risk  
Stefano Notari, SISTEMA
- 1130-1230 WebGIS Tool for Multi-Risk Assessment of Cultural and Natural Heritage  
Alessandro Sardella, CNR-ISAC
- 1230-1330 Lunch Break
- 1330-1700 Syndicate Working Groups on Case Studies - Focus Climate Change Challenges  
Alessandra Bonazza, Alessandro Sardella, CNR-ISAC  
Stefano Notari, SISTEMA

**TUESDAY, 08 JUNE 2021**

- 0900-1000 Impact of natural and man-made Threats on Cultural Heritage  
Miloš Drdický, Institute of Theoretical and Applied Mechanics, Czech Academy of Sciences (ITAM)
- 1000-1100 Vulnerability Assessment for Cultural Heritage Protection  
Riccardo Ciocchetti, ITAM
- 1100-1200 Resilience Preparedness of Cultural Heritage against natural and man-made Disasters  
Miloš Drdický, ITAM
- 1200-1300 Lunch Break
- 1300-1700 Syndicate Working Groups on Case Studies - Focus Vulnerability & Preventive Conservation  
Riccardo Ciocchetti, Miloš Drdický, ITAM
- 1700-1800 Valorisation and Conservation of Underwater Cultural Heritage: Challenge and Perspective  
Michela Ricca, University of Calabria, DIBEST

**WEDNESDAY, 09 JUNE 2021**

- 0900-1100 Assessing Threats and Managing Risk for Cultural Heritage  
Anna Kalsier, Danubius University Krems (DUK)
- 1100-1200 Self-caused Climate Change In our Cultural Landscapes: How to assess Vulnerabilities of our Landscapes with Rapid Scoring Tools  
Christine Rottenbacher, DUK
- 1200-1300 Lunch Break
- 1300-1700 Syndicate Working Groups on Case Studies - Focus Risk Assessment & Management  
Anna Kalsier, DUK
- 1830 Evening Lecture / Spotlight Cultural Property Protection  
Host Nation Fort Drum: Protecting Cultural Landscapes in Northern NY  
Laurie Rush, US Army 10<sup>th</sup> Mountain Division

**THURSDAY, 10 JUNE 2021**

- 0900-1230 1<sup>st</sup> International STRENCH Conference: Strengthening Resilience of Cultural Heritage at Risk in a Changing Environment
- 1230-1330 Lunch Break
- 1330-1700 Syndicate Working Groups on Case Studies - Finalization  
Anna Kalsier, DUK

**FRIDAY, 11 JUNE 2021**

- 0900-1200 Presentation of Case Studies  
Participants of the Summer School
- 1200-1230 Closure of the Summer School (CNR-ISAC, DUK)

**VULNERABILITY**

(V = 0,26)      V = 0,08      V = 0,23

**EMERGENCY PLAN - PROTECTION OF CULTURAL LANDSCAPES IN THE DISTRICT OF FORCHHEIM**

1. Risk analysis

		RISK ASSESSMENT OF CLIMATE RELATED HAZARDS					
		Almost certain	Likely	Possible	Unlikely	Rare	Insufficient water resources
Likelihood	Almost certain	High	High	High	High	High	High
	Likely	High	High	High	High	High	High
Possible	Almost certain	High	High	High	High	High	High
	Likely	High	High	High	High	High	High
Unlikely	Almost certain	High	High	High	High	High	High
	Likely	High	High	High	High	High	High
Rare	Almost certain	High	High	High	High	High	High
	Likely	High	High	High	High	High	High
		Insufficient water resources	Fire	Late Frost	Pests	Flooding (pluv)	Flooding (glac)
		Insufficient	Minor	Moderate	Major	Severe	Severe
		Impact					



## STRENCH Conference held on June 10th 2021



**STRENCH Conference on June 10<sup>th</sup> 2021** brought together distinguished experts on climate modelling, climate change related threats to cultural and natural heritage, vulnerability ranking and criticalities for cultural heritage protection as well as the use of 21st century technology for defining priorities for action and preparing disaster response mechanisms for cultural heritage protection.

### **Short summary:**

- 🌱 Hosted online on June 10th 2021, from 0900 to 1300 hrs CEST, attracting 45 participants, held in English language

The 1st International STRENCH Conference: “Strengthening Resilience of Cultural Heritage at Risk in a Changing Environment”, covered a multitude highly relevant topics in form of discussions by international experts (ITA, AUT, SLO and CZ)). These including topics such as:

Cooperation for safeguarding Cultural Heritage – Interreg CE current and future programme

STRENGTHening resilience of Cultural Heritage at risk in a changing environment through proactive transnational cooperation Interreg CE STRENCH

Management tools for protecting Historic Castel Parks – Interreg CE HICAPS

HERitage Resilience Against CLimate Events on Site – H2020 HERACLES

Intangible heritage as leverage for adaptation to climate change – Interreg CE CULTURERECOVERY

Methodology for vulnerability assessment of cultural heritage at risk

WebGIS tool for multi-risk assessment of cultural heritage exposed to climate extreme events

The STRENCH Project Partners would like to convey their sincerest gratitude to the participants and the lecturers who participated in the conference.



## Definition of a methodology for ranking vulnerability of cultural heritage

(by Riccardo Cacciotti, Miloš Drdáčký, with the contribution of all project partners)

STRENCH investigates risk reduction strategies for cultural landscapes, ruined hamlets and parks and gardens in relation to selected hazards such as flash flood, landslides, wind storms and fires. In this perspective, understanding vulnerability constitutes a necessary step towards risk reduction and the pursuing of disaster resilience. Indeed, one of the primary aims of the project is to provide a methodology for ranking vulnerabilities. In STRENCH, vulnerability is interpreted as the combination of three main factors: 1) susceptibility, 2) exposure and 3) resilience. Starting from these requirements, a hierarchy tree is introduced including various branches (referred to as criteria or sub-criteria) which help conceptualizing the evaluation.



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*Conceptual model for vulnerability*

The deliverable *D.T1.1.2 Definition of a methodology for ranking vulnerability of cultural heritage* presents the methodology and the conceptual model proposed for vulnerability assessment, outlining the requirements and criteria used.

In STRENCH, the evaluation of the vulnerability of pilot sites follows the simplified guidelines provided in the annex of the deliverable. Here, weights for requirements, criteria and sub-criteria are outlined together with the values used for their evaluation. Weights and values are determined using the Analytic Hierarchy Process method and are further adjusted by experts' opinion and literature review including capitalized project results. Aggregation of values into a vulnerability index is based on the additive method. It should be underlined that the presented values and weights should be considered for reference only and may vary according to site-specific requirements (e.g. hazard type, CH typology etc.), requiring adjustments in real life applications. Multi-risk situations and synergetic effects of concurring climate-related actions are also not taken into account and should require an in-depth analysis.



## Vulnerability Assessment Example Pilot Site Wachau (Melk Abbey)

When applying the vulnerability assessment to a site each factor (Susceptibility, Exposure and Resilience) is determined by a set of criteria and sub criteria which are composed of multiple choice like questions. Each choice is given a certain value which is then used to compute the category (for e.g. Exposure) for the site itself. The value of each factor is then further used to determine the vulnerability of the site. Please bear in mind that for the sake of brevity only a small selection of criteria and sub-criteria are presented. To illustrate the vulnerability assessment.

### Melk Abbey

Located at the western end of the Wachau Cultural Landscape the Melk Abbey is one of the highlights of the UNESCO world heritage site which encompasses the entire region. The Melk Abbey was founded in 1089 is a popular tourist destination attracting roughly half a million visitors annually in the years prior to the Covid-19 pandemic. The Abbey itself is located on a hill close to the riverbanks of the Danube River and is filled with cultural heritage assesst dispersed throughout the abbies park, museum, historic library as well as the church.



©KERMER

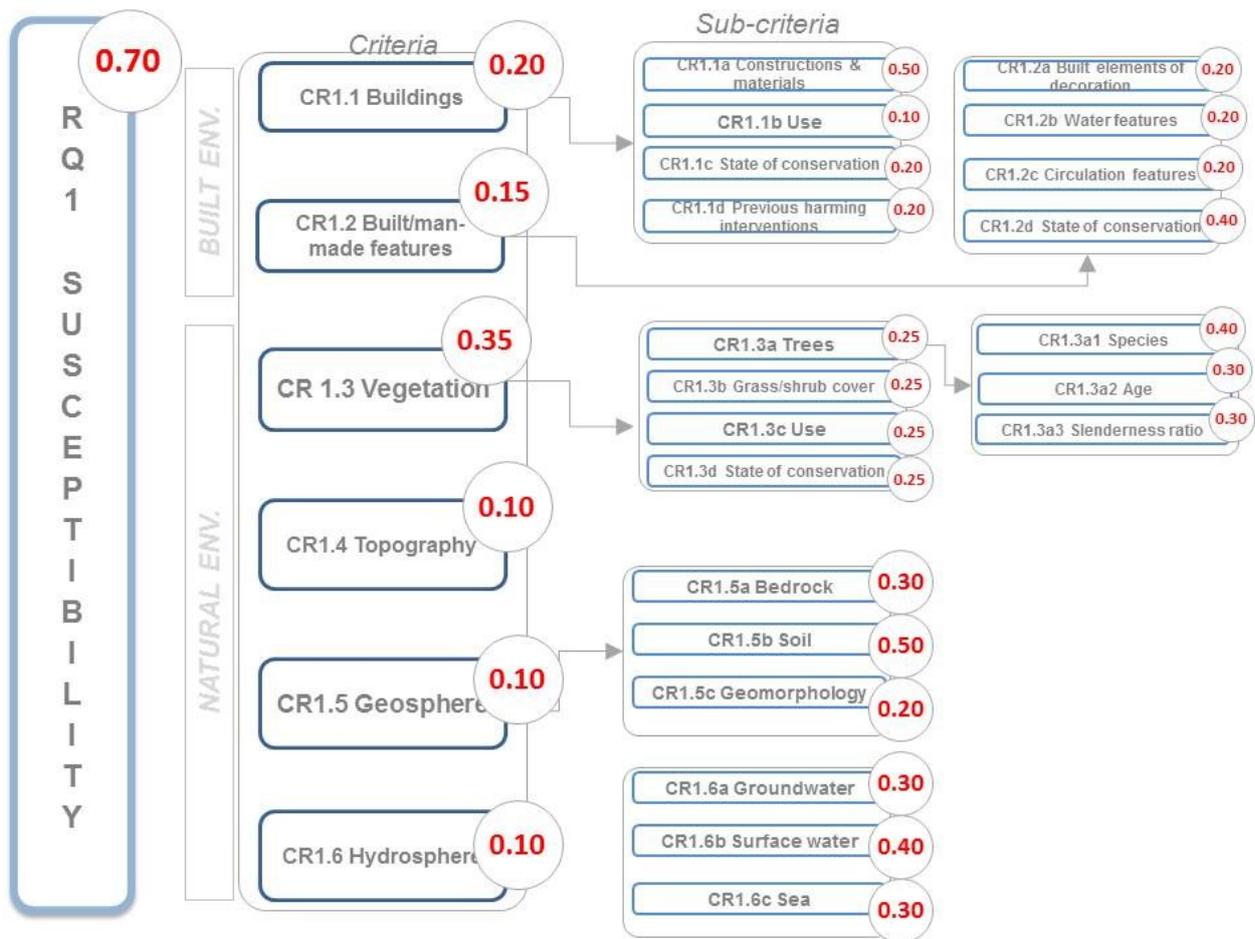
Weblink Abbey Melk: <https://www.stiftmelk.at/de/>

For the assesment of the Melk Abbey the saftey officer of the abbey Mr. Gerhard Scheiber was kind enough to give provide us with his input. It should be underlined that, for the sake of providing an example, the evaluation of only a few criteria/ sub-criteria is here presented. The remaining part of the assessment is therefore omitted.



**Evaluation of SUSCEPTIBILITY (sub-)criteria:**

The Susceptibility is evaluated by 6 criteria which themselves consist of 21 sub-criteria.



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Taking a closer look at the criteria CR1.1 “Buildings” specifically at the simpler sub-criteria CR1.1a Constructions & Materials we are given the option in choosing between the following values:

Based on information gathered in one of the capitalized projects (ProteCHt2save) preceding STRENCH and the input of the safety officer of the abbey it was determined that the site is composed of structurally sound constructions made of resistant materials. A Value of 0.00 was added to the sub criterion which in this case is a positive value when determining the susceptibility.

Value Meaning	Value
Structurally sound constructions made of resistant materials	0.00
Structurally sound constructions made of materials prone to degradation or impact damage	0.50
Structurally weak constructions made of material prone to degradation or impact damage	1.00



Another rather simple example would be the determination of the CR1.5 Geosphere via the sub-criteria CR1.5 Soil:

When researching the official soil-map of the federal state of lower Austria (in which the Melk Abbey is located) it can be determined that the site in question lays on fine-grained soil (silt, clay) adding a value of 0.30 to the computation.

Value Meaning	Value
coarse-grained soil (sand, gravel)	0.00
fine-grained soil (silt, clay)	0.30
highly organic soil (peat)	1.00

After having determined values for each sub-criteria / criteria, the susceptibility can be determined by using the following formula:

**Susceptibility:** Buildings= 0.21, Built/man-made features= 0.60, Vegetation= 0.255, Topography= 0.30, Geosphere= 0.15, Hydrosphere = 0.40

$$\text{Susceptibility} = (0.20 \times \text{Building}) + (0.15 \times \text{Built/man-made features}) + (0.35 \times \text{Vegetation}) + (0.10 \times \text{Topography}) + (0.10 \times \text{Geosphere}) + (0.10 \times \text{Hydrosphere})$$

Where Building= 0.21, Built/man-made features= 0.60, Vegetation= 0.255, Topography= 0.30, Geosphere= 0.15, Hydrosphere = 0.40, as evaluated for the given case study using the weights and value scales provided in the annex to D.T1.1.2

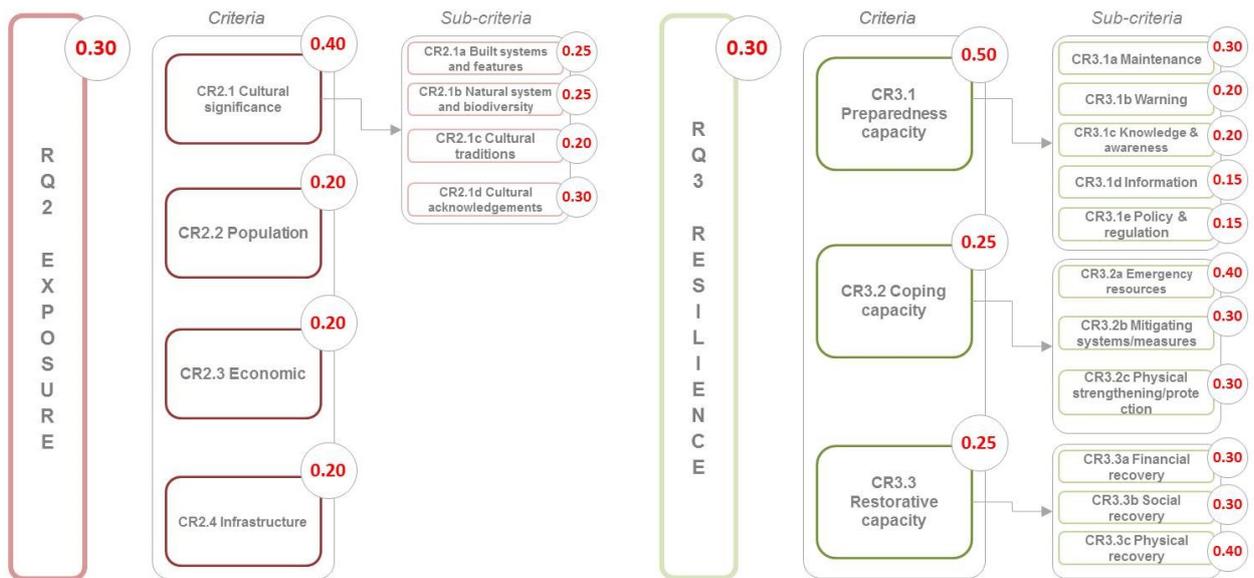
Finally, the overall susceptibility is calculated as follows:

→ **Susceptibility = 0.30625 (low value beneficial)**

**Evaluation of EXPOSURE & RESILIENCE (sub-)criteria:**

The same methodology as shown above for determining the Susceptibility applies when evaluating the Exposure and Resilience of the site in question. Once these have been determined the vulnerability evaluation can be concluded.





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$$\text{Exposure} = (0.40 \times \text{Cultural significance}) + (0.20 \times \text{Population}) + (0.10 \times \text{Economic}) + (0.20 \times \text{Infrastructure})$$

With Cultural significance= 1.00, Population= 0.30, Economic= 1.00, Infrastructure= 1.00

→ Exposure = 0.76 (low value beneficial)

$$\text{Resilience} = (0.50 \times \text{Preparedness capacity}) + (0.25 \times \text{Coping capacity}) + (0.25 \times \text{Restorative capacity})$$

Where Preparedness capacity: = 0.80, Coping capacity: = 1.00, Restorative capacity: = 0.70

→ Resilience = 0.825 (high value beneficial)

**Vulnerability evaluation Melk Abbey:**

$$\text{Vulnerability} = 0.70 \times \text{Susceptibility} + 0.30 \times \text{Exposure} - 0.30 \times \text{Resilience}$$

$$\text{Vulnerability} = \underline{0.194875}$$

With  $0 \leq V \leq 1$  (low to high vulnerability).



## Spotlight: WebGIS tool – tutorial for user friendly transfer

(by Alessandro Sardella, Carlo Del Grande, Alessandra Bonazza)

Since its inception in the Interreg CE project ProteCHt2save the WebGIS tool, a free to use risk mapping tool for cultural heritage protection, has been under constant development.

The updated version of the WebGIS Tool is specifically implemented in order to support the production of strategies for cultural heritage protection to be integrated into plans for Disasters Risk Reduction in line with the 4 Priorities of the Sendai Framework for Disaster Risk Reduction 2015-2030. In this framework the WebGIS Tool propose ready-to-use solutions such as climate hazard maps and methodology for vulnerability ranking of cultural heritage, including landscape also providing hazard maps generated applying satellite services, measure-oriented database on the criticalities of CH and intervention priorities to strength resilience to disasters. Specifically, the use of Copernicus services and its integration in the WebGIS Tool constitute a notable innovation that will deliver a direct impact to the management of natural and cultural heritage sites, with high potentiality to be scalable to new sectors under threat by climate change.

Within the STRENCH project one of the main aims is to enhance the user friendliness of the WebGIS tool. Taking further steps into this direction the experts from CNR ISAC (The Institute for Atmospheric Sciences and Climate) in Bologna, Italy, created a tutorial for the user friendly transfer of the WebGIS tool.

 **Access the WebGIS tool “Risk mapping tool for cultural heritage protection” via:**  
<https://www.protecht2save-wgt.eu/>.

Starting with an overview of the registration process and subsequent unlimited and free of charge access to the WebGIS tool, the main focus of the tutorial lies on giving the user a navigation guideline and aiding in the process of selecting/choosing the appropriate climate extreme indices in order to customize the mapping to ones specific needs. Thus the users are introduced to both the climate variables and climate extreme events which they can choose from in order to proceed with the mapping.

Extreme events		Climate variables
Climate variables	Code	Description
Tmin	Tn	daily minimum temperature
Tmax	Tx	daily maximum temperature
Precipitation	RR	daily cumulated precipitation <i>(also elaborated at seasonal timescale)</i>

© ISAC



Example of one of the 9 extreme indices events the user can choose from:

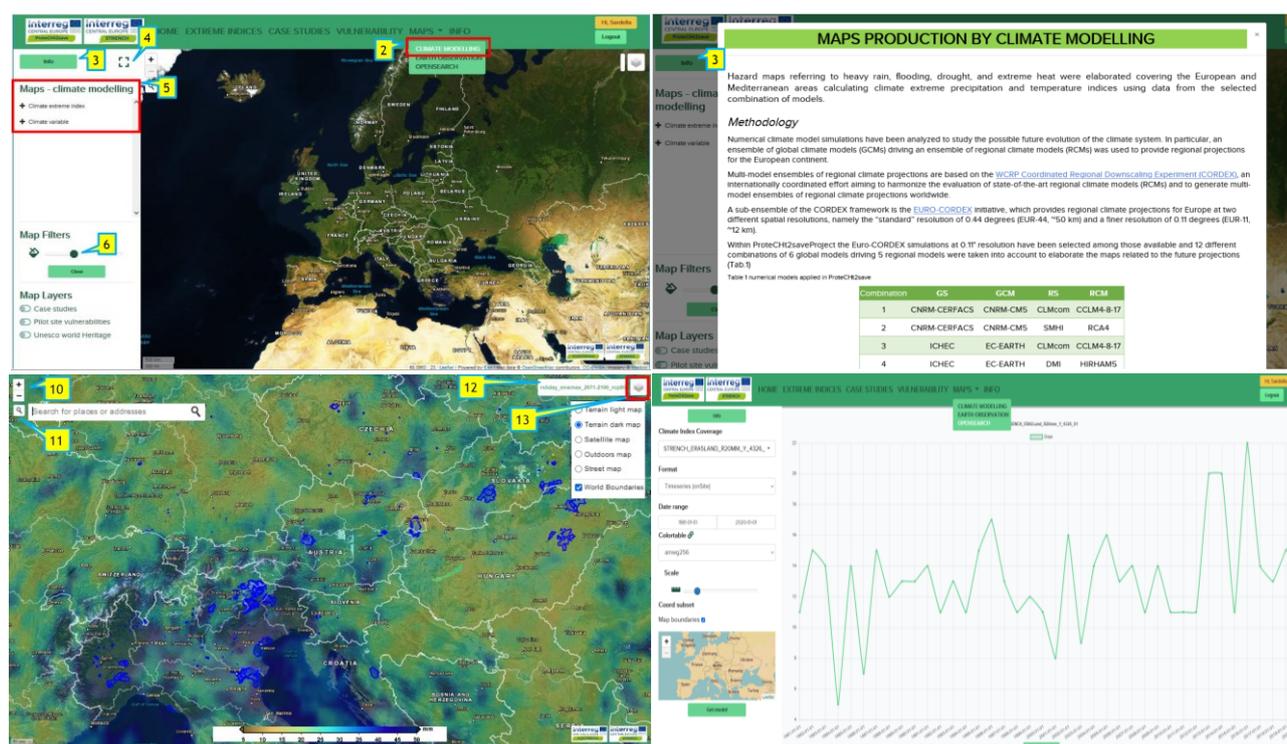
Extreme heating	Tx90p	Extremely warm days
Percentage of days in a year when daily maximum temperature is greater than the 90th percentile. A threshold based on the 90th percentile selects only 10% of the warmest days over a 30 year-long reference period.		

© ISAC

Further instructions are provided on the [STRENCH Case-Studies](#) which are separately accessible via an extra tab providing the viewer with information on the cultural heritage at risk and the specific vulnerabilities and dangers each location faces.

Same applies to the [Vulnerability-Section](#) which contains the methodology developed for vulnerability ranking of cultural heritage categories exposed to extreme climate events. The rate of vulnerability of all pilot sites investigated in STRENCH will be available soon.

Moving to the core of the WebGIS the Mapping Tool. This tool can be used to create, visualize and download climate maps as well as time series & data, making it a valuable tool for planning cultural heritage protection in the face of a changing climate. When first accessing the “MAPS” function this task may seem overwhelming. With the new tutorial each step in creating your own map is compressed to a roughly 12-page tutorial including screenshots in order to give the user a compact guideline when creating their own maps for their specific usage.



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The current version of the WebGIS tool – Tutorial can be downloaded as a pdf. file on the STRENCH homepage or via the direct link below:

**WebGIS tool – Tutorial PDF:** <https://www.interreg-central.eu/Content.Node/STRENCH/CE1665-STRENCH-D.T1.3.3-Tutorial-development-for-user-friend.pdf>



## Awareness raising events fostering transnational cooperation in disaster risk reduction ITA, HUN, AUT & Local Working Table, GER

ITALY, 16<sup>th</sup> September 2021 – walk for the European Researchers' Night FVG CNR

On the afternoon of Thursday 16 September, a walk for citizens took place at the Villa Ghigi Park. This event was included in the calendar of the initiatives planned for the European Researchers' Night 2021, which were attended throughout Europe on Friday 24 September.

The intent of the event, led by Maria Teresa Guerra e Ivan Bisetti of Fondazione Villa Ghigi and by Paola De Nuntiis of CNR-ISAC, was to explain the vulnerabilities that characterize a historical garden subject to the effects of climate changes and management interventions related to the conservation of historical, cultural and landscape heritage. More generally, the aim of the walk was to illustrate to the participants, students and interested citizens, the STRENCH project and its capitalized projects (HICAPS and ProteCHt2save).

After a general introduction, concrete examples were shown of the effects produced by changing climate conditions of recent times, such as prolonged periods of drought, unseasonal snowfall and thunderstorms accompanied by strong winds and flash floods on the historic garden and in particular the arboreal heritage.

Starting with the presented hazards, the issues related in finding and implementing appropriate management choices were addressed in an open, shared and stimulating discussion.

Illustration of The annual management plan of the park; this plan allows to address the various critical issues through a coordinated set of interventions based on techniques with low impact and a distinguished management of the various areas of the park, a masting monitoring program and a series of cultural interventions (pruning, stabilizations of branches and trunks) for the reduction of the potential risks for visitors, a list of emergency irrigations and, finally, a plan of renewal plant heritage through the planting of new trees and shrubs carefully selected.



© Fondazione Villa Ghigi

During the walk, which ended at sunset, informative materials of STRENCH and of the capitalized projects ProteCHt2save and HICAPS were distributed with an invitation to visit the social media channels and the official website of the project.



## Hungary, 28<sup>th</sup> September 2021 - Preparing for the effects of climate change and protecting our natural and cultural heritage LBDCA

On the 28th of September 2021 a STRENCH awareness raising event on the topic of preparing for effects of climate change and protecting our natural and cultural heritage was hosted by the Hungarian project partner the Lake Balaton Coordination Agency (LBDCA) in the town of Siófok.

Commencing with the event Zita Könczölné Egerszegi (LBDCA) started with a presentation of the STRENCH project, Lake Balaton Development Coordination Agency before handing the word to Dr. Ákos Horváth, head of the Storm Warning Observatory of the Hungarian Meteorological Service who continued with a presentation on the perceived effects of climate change, extreme features and prognosis. As well as Changes in the meteorological characteristics of Lake Balaton. The Parameters affected by climate change and the nature and extent of the changes. The factors



© Lake Balaton Development Coordination

affecting the accuracy of the forecast and extreme weather events in recent years in the Lake Balaton area. Moving further in the Agenda Imre Petróczi, professional deputy director, Balaton Uplands National Park Directorate followed up by presenting the vulnerability of the natural and cultural heritage at Lake Balaton by providing an overview on the Lake Balaton national park and the surrounding nature reserves, natural monuments, Natura 2000 sites and Ramsar sites. Mr Petróczi further elaborated on the cultural landscape of the Lake Balaton and its attractive living space and potential for eco-tourism which led to the next topic on what sustainable and competitive tourism means. The word was then handed to János Kraft a geologist at the Baranya County Government Office Authority Mining Department who further analysed the highlands and loesslands of the region, their development and their endangerment. Following the iconic loess of the Balaton region Dr. Piroska Pomogyi a hydrobiologist of the National Directorate General of



© Lake Balaton Development Coordination

Water Management in the Central Transdanubia Water Directorate continued on the topic of deteriorating wetlands, reeds and aquatic world of the region. György Heizler a retired firefighter colonel of the Hungarian Fire Brigade Association spoke further of additional vulnerabilities and risks such as extreme weather events and their risk assessment, mapping danger, the issue of complex systems (cultural landscapes, historical, archaeological sites) and early warning systems and disaster preparedness.



Following the presentation 49 participants were invited to join a Q&A session. Resulting from the presentation and following sessions conclusions were drawn for cultural heritage (CH) management issues, strategies & measures and the upstreaming of these to national policy.

CH management issues at local level: In the surveyed area flash floods and heavy rain, lightning and wind are the main risks. In the lower part of the nature reserve, the water from the creek may spill over, however this doesn't threaten the cultural heritage buildings on site. In case of heavy rainfall flash floods could form on the agricultural lands above which could erode the soil, and because of the slopes the runoff water can damage the vegetation below and especially the walls and foundations of Zichy mansion. The maintenance of the area and vegetation is currently the task of the municipality, however there is no support from experts (ecological, forestry, plant protection, nature conservation). Maintenance management of 130-year-old trees is incomplete. The Zichy mansion building is basically stable, however the plaster of the exterior, especially the rear walls of the building shows signs of damage and needs to be renovated. Artefact databases are available, however, these are only available to first responders and rescue plans do not include them.

Strategies & measures: Regulating the farming practices in the area above the Zichy mansion could reduce potential soil erosion in the event of a flash flood. Because of the topographic features of the area a small, continuous ditch would also significantly protect the masonry and the foundations of the Zichy mansion buildings. Experts should be involved in the maintenance of the area and vegetation in planned and regulated manner. Regular maintenance treatment of old trees is recommended. Improving the physical protection and the condition of external walls of the building is recommended. Improving the rescue plans of the Zichy mansion building is recommended. It is also recommended to inform and possibly involve the local population in the rescue plans to some degree. Preparation for drastic changes the local flora and fauna due climatic conditions is recommended.



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Upstreaming at national policy levels: It is recommended to build complex plans using nature conservation, monument protection data and evaluating disaster management surveys. It is advisable to specify the tasks in a clear written plan which involves the owner/operator and the local municipality. Note that in the case of Zichy Mansion, the two are not the same. Nature conservation and cultural heritage experts need to be available and included in the complex rescue plans as well. Further exploration and assessment of the relations of topography, soil, groundwater and surface water in terms of vegetation and building vulnerability is recommended.



## Austria, 28<sup>th</sup> April 2021 – Fostering cooperation for cultural heritage protection during natural disasters (DUK & SISTEMA)

Hosted by the Danube University Krems (DUK) Centre for Cultural Property Protection and the STRENCH project partner SISTEMA, the awareness raising event was organised as joint event with the Interreg Alpine Space project CHEERS, for which the Austrian Institute of Technology acted as co-organizer of the event.

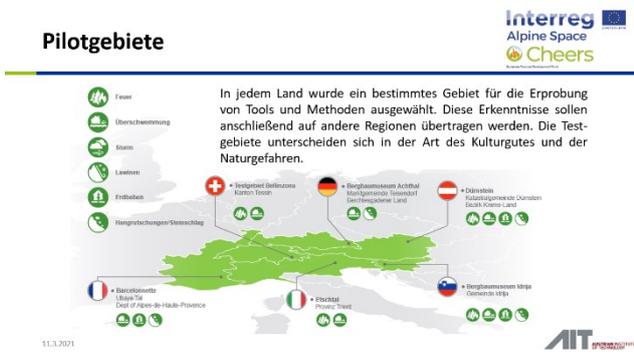
The event was held as a live online discussion between distinguished experts in the fields of disaster risk reduction for cultural heritage and transnational cooperation from Austria, Germany, and Switzerland, thus focusing on the German speaking part of Europe, which also had the benefit of creating no language barrier for the panel discussion and the subsequent discussion with the audience of the event.



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Made up of 2 hosts 15 panellists ensued in various presentations after which a lively discussion with the 25 additional participants ensued. The discussion itself was recorded and included topics such as the cultural heritage (CH) management issues, strategies and measures which could be implemented for overcoming the identified issues as well as upstreaming possibilities at national policy levels were discussed.

Cultural heritage (CH) management issues at local level: Aside from natural hazards organizational shortcomings such as the lack of a general plan for the protection of cultural heritage, neither on regional nor local level, as is the case in Austria were identified. In the Case of the pilot site Wachau the CH owners are responsible for the protection of these with no liability to inform the authorities on existing plans. There are no national guidelines for the development and implementation of such plans. One of the main points of discussion surrounded the necessity of cultural heritage protection from both man-made and natural disasters and on possible contributions to the development of guidelines for emergency preparedness plans for both movable and immovable heritage. Although management plans for the UNESCO World Heritage sites in Austria exist, to which the Wachau cultural landscape belongs, these do not necessarily take the issues of cultural heritage protection



11.3.2021

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into account. Therefore, the resulting emergency plans are limited in their scope by mainly focusing on fighting various local natural catastrophes with lacking emergency preparedness and/or evacuation plans in place for CH assets. This is the result of a lack cooperation and insufficient knowledge transfer between the various parties/stakeholders involved in CH protection.



Strategies & measures: Transnational cooperation between organization involved in the CH protection can be first step in enhancing the preparedness and resilience of CH at risk and it is a measure that is easy to implement, aiming at raising the awareness of different stakeholders in the field of cultural heritage protection and bringing to their attention what similar entities in other countries have faced, have developed and implemented against a number of threats.

The awareness raising event aimed at bringing together experts and stakeholders in disaster preparedness and cultural heritage protection from Austria, Germany, and Switzerland and to highlight current developments and situation, especially in cultural heritage protection preparedness.

As such the event was successful since different stakeholders from German speaking countries connected and further exchange details and expertise and lessons learned.

The Austrian Burghauptmannschaft for example, which is responsible for the upkeep and management of inter alia the former Imperial castles in Vienna and Innsbruck, got in contact with the Fire Brigades from Bavaria, enquiring about details on how the German colleagues prepare cultural heritage for fire and water damage. As a follow up on sharing of experience and related documents, the Burghauptmannschaft Austria now develops a short training programme for their staff regarding cultural heritage protection and firefighting. Similar incentives are foreseen and expected to happen in the upcoming months and years.

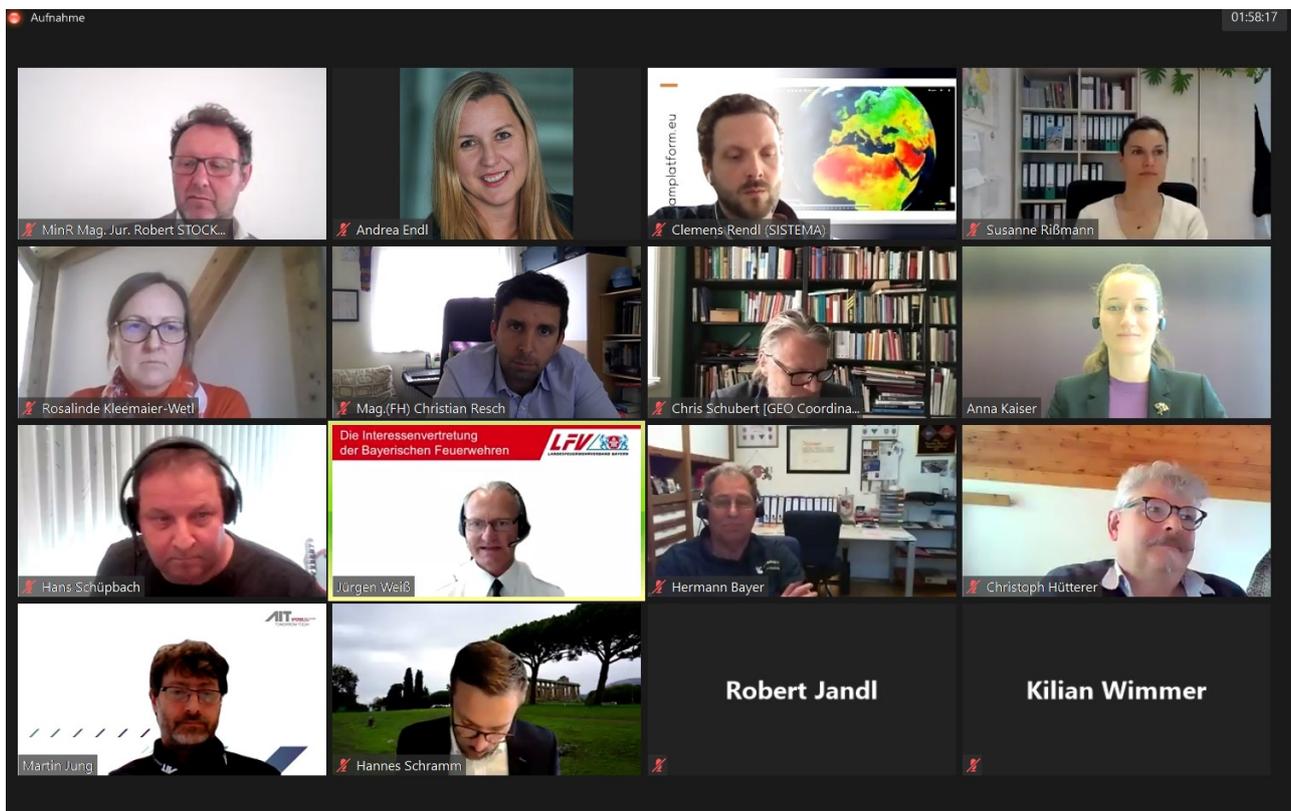
Topics tackled in the event, which is to be seen as one of the first measures to overcome identified issues in the management of risks for cultural heritage sites (in that case the Wachau area, but on a regional level Eastern Austria and on an international level the German speaking countries of Central Europe) included:

- 🌱 What is cultural property and what is the difference to cultural heritage?
- 🌱 Which legal status do both hold?
- 🌱 Who decides what cultural property and heritage is?
- 🌱 Which criteria should be considered when deciding on the status of cultural heritage?
- 🌱 How to prepare an effective emergency plan for a cultural institution.
- 🌱 Which criteria are used for prioritising objects?
- 🌱 How important is the emotional and personal component in preparing cultural heritage for disastrous events?
- 🌱 Which role does the civil society play in cultural heritage protection and disaster preparedness?
- 🌱 How to assess threats to cultural heritage.
- 🌱 Examples of cultural heritage and natural heritage monitoring using different types of satellite data?
- 🌱 What will be the biggest threats related to climate change coming towards us during the next 50 years?
- 🌱 What does the Group on Earth Observation Coordination contribute to the Group on Earth Cultural Heritage Initiatives?



- 🕒 What role does cultural heritage protection hold in the EU Commission as research field?
- 🕒 What is the importance of cultural heritage for the Austrian Ministry of the Interior? How is it reflected in the crisis preparedness plans of Austria?
- 🕒 Which roles can emergency responders play in cultural heritage protection?
- 🕒 How best to build bridges between the different stakeholders (academia, emergency responders, cultural heritage responsible)?
- 🕒 How does the situation regarding preparedness and cultural heritage protection look like in Austria, Germany, and Switzerland?
- 🕒 How to use satellite data in and for cultural heritage protection.

Upstreaming at national policy levels: Existing barriers seem to be first and foremost missing awareness on the topic of cultural heritage and the necessity of its protection; this does not hold true for all the sites in question though, since the Wachau has been threatened by numerous natural catastrophes over the decades. However, most of the time cultural heritage was not damaged or the number one item threatened, thus Austria and especially the Wachau region, have been very fortunate. On the other hand, this sometimes leads to missing awareness regarding the importance of preparedness measures. A very sensible approach at the moment seems to be to highlight the importance and benefits that are to be gained by implementing sustainable preparedness measures on the different levels and by trying to identify methods and tools that can be used by private persons as well as public institutions and emergency organisations likely to be called in for assistance if cultural heritage is threatened or damaged.



## Germany, September 16<sup>th</sup> 2021 - STRENCH Local Working Table – Year 2, District Administration Forchheim

On September 16<sup>th</sup> 2021 the District Administration of Forchheim hosted their second STRENCH Local Working Table (LWT) laying the focus on the unique and invaluable cultural landscape found within the district itself. Seven participants from the sectors forestry, agriculture, flood prevention, drinking water resources, fruit growing and nature conservation joined the LWT and contributed with their expertise to the two major thematic parts. The first describing climate related and natural hazards facing the District of Forchheim while the second part aimed for evaluating climate adaption measures.

Due to the information provided in the first part of the LWT, the participant's awareness of climate related hazards in the DoF was raised laying the basis for their contribution in the adaption of risk management strategies with respect to climate change. The given input will be compared and evaluated within the scope of the STRNECH deliverable regarding *"Sustainable risk management strategies for cultural heritage"*.



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Broadly spoken the Local Working Table 2 contributed to:

- 🌱 An increased awareness of local stakeholder with respect to climate related and natural hazards
- 🌱 Implementation of risk management strategies due to valuable insights into how climate change affects the District of Forchheim
- 🌱 Awareness of sustainable and implementable climate adaption measures mitigating climate change related hazards
- 🌱 Creation of a climate adaption strategy making use of the ideas, suggestions and opinions elaborated in the LWT I and LWT II
- 🌱 Planning and organizing the awareness raising event held in 10/2021 as a major contribution to the climate action week in Forchheim ([www.klimawoche-forchheim.de](http://www.klimawoche-forchheim.de)).



## **STRENCH Promo-Video Onsite Filming Completion**

As part of the STRENCH project's work package communication a video is produced in order to promote the projects outputs. Using a story telling approach the video-content aims to raise the awareness of the STRENCH project and to foster the usage of the developed tools with the goal to strengthen the resilience of cultural heritage at risk.

For this purpose, the chosen film production company W4Event filmed at 6 of the 7 STRENCH pilot sites during specific dates throughout the months July and September in order gather video material and hold interviews with the relevant STRENCH Work-Package Leads

The STENCH project team would like to convey their sincerest gratitude to W4Event who managed to perform the onsite filming without delay during the Covid-19 pandemic, which has been an unwelcome company to us during most of the project duration.

### **Final onsite filming performed on 29 September 2021 at the FVG, Italy**

On 29 September the Villa Ghigi Park, one of the pilot sites of the project, hosted the W4Event crew for the final onsite filming day of the STRENCH promotional video. Aside from scenic shots of the Villa Ghigi Park and filming its most significant sites, the occasion was used to hold an interview with the project coordinator Professor Alessandra Bonazza PhD on the STRENCH project and its outputs such as the WebGIS tool.



© Fondiazone Villa Ghigi





**STRENCH**

# STRENGTHENING Resilience of Cultural Heritage at Risk



**READY-TO-USE SOLUTIONS**

- » WebGIS tool for multi-risk assessment on cultural heritage in Central Europe
- » hazard maps of extreme events in Central Europe for decision making in disaster risk reduction
- » methodology for vulnerability assessment of cultural heritage at risk
- » sustainable risk management strategies for cultural heritage

**CULTURAL HERITAGE CATEGORIES**

- » cultural landscapes
- » ruined villages
- » historic parks
- » archaeological sites in mountain and coastal areas

**HAZARDS**

- » heavy rain
- » (large basin) floods
- » flash floods
- » landslides
- » fire due to drought
- » windstorm



**PROJECTS CAPITALISED**

- » Interreg Central Europe – BhENEFIT
- » Interreg Central Europe – RUINS
- » Interreg Central Europe – ProteCHT2save
- » Interreg Central Europe– HICAPs
- » H2020 – HERACLES
- » H2020 – SHELTER
- » FP6 – Noah’s Ark
- » FP7 – Climate for Culture
- » DG-EAC – Safeguarding Cultural Heritage from Natural and Man-Made Disasters

**PROJECT DURATION**

**01.03.2020 – 28.02.2022**

€ ERDF co-financing  
1.064.956,62 €

total eligible budget  
1.301.712,50 €

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