

NH6.4

Remote Sensing & Cultural Heritage

Tangible Cultural Heritage (TCH) plays a key role in building the memory and roots of human society. Unfortunately, TCH sites are often threatened by soil erosion and natural hazards (e.g. landslides, earthquakes, flooding, tropical storms, forest fire); further damage can also arise from the fragility of the site's structures and materials with respect to anthropogenic hazards (destructive sabotage, war) and incorrect urban planning. The protection and conservation of TCH sites are pressing issues not only for the conservators/scientist's community but for the whole society. For a correct conservation strategy it is necessary to implement a specific inter-disciplinary approach, that should be planned considering the site characteristics (topography, geomorphological-geological setting) and typology of the related hazard. In this perspective the use of remote sensing (RS) techniques applied from spaceborne, airborne and ground-based to UAV platforms (including, but not limited to, Radar interferometry, Lidar, Digital photogrammetry, Optical and Infrared imaging) combined with detailed field surveys, sample laboratory analysis, geotechnical and geophysical analysis, can provide the fundamental data for the implementation of mapping products and geodatabases, especially in developing countries with limited data, to be used as a starting point for TCH management plans. The goal of this Session is to gather high-quality original contributions and case studies applications on the use of RS techniques for protection and conservation of tangible Cultural and Natural Heritage sites (these include but are not limited to the UNESCO World Heritage and Tentative Lists) for risk mitigation practices and management plans.

Share: <https://meetingorganizer.copernicus.org/EGU2020/session/34846>

Convener: William Frodella | Co-conveners: Andrea Ciampalini, Mikheil Elashvili, Daniele Spizzichino

[Displays](#) Chat Wed, 06 May, 14:00–15:45

D1924

EGU2020-19435

[**Applying InfraRed Thermography \(IRT\) for the protection and conservation of rupestrian CH sites affected by slope instabilities**](#)

William Frodella, Daniele Spizzichino, Giovanni Gigli, Mikheil Elashvili, Claudio Margottini, and Nicola Casagli

D1925

EGU2020-13739

[**Satellite monitoring of ground and structure deformations applied to Colosseum archaeological park**](#)

Alfonsina Russo, **Irma Della Giovampaola**, Daniele Spizzichino, and Gabriele Leoni

D1926

EGU2020-6652

[**DInSAR analysis for geohazard assessment at the Roman city of Carsulae \(Central Italy\)**](#)

Gabriele Leoni, Silvia Casciarri, Paolo Maria Guarino, Luca Guerrieri, Francesco Menniti, Fabio Pagano, Irene Rischia, and Daniele Spizzichino

D1927

EGU2020-10914

[**Integrated application of Remote sensing and Cultural heritage : the EO4GEO project scenarios**](#)

Daniele Spizzichino, Carlo Cipolloni, Valerio Comerci, Mariapia Congi, Claudia Delfini, Federica Ferrigno, Gabriele Leoni, Renato Ventura, and Luca Guerrieri

D1928

EGU2020-6857

[**Characterization and monitoring of a riverbank failure in a UNESCO World Heritage Site: the 2016 Florence \(Italy\) case study**](#)

Veronica Tofani, Stefano Morelli, Veronica Pazzi, Luca Tanteri, Massimiliano Nocentini, Luca Lombardi, Giovanni Gigli, and Nicola Casagli

D1929

EGU2020-18918

[**Modeling Surficial Water runoff and estimation of its damaging factor on Rock Curved Cultural Heritage Monuments of Georgia – Application of Close Range Aerial Photogrammetry**](#)

Akaki Nadaria, **Giorgi Kirkitadze**, Mikheil Lobjanidze, Nikoloz Vacheishvili, and Mikheil Elashvili

D1930

EGU2020-9519

Highlight

[**UAV photogrammetry and 3D scan data for topographic mapping and monitoring of maritime heritage**](#)

James Barry, Kieran Craven, Ronan O'Toole, and Sean Cullen

D1931

EGU2020-18154

Highlight

[**Cultural heritage monument complex monitoring data analyses using machine learning algorithms**](#)

David Kvavadze, Giorgi Basilaia, Tea Munchava, Giorgi Lалуashvili, and Mikheil Elashvili

D1932

EGU2020-10701

Highlight

[**Towards a neural network approach for automated recognition of lichen-covered prehistoric carvings at Stonehenge**](#)

Gavin Leong and Matthew Brolly

D1933

EGU2020-17498

[**Monitoring of moisture levels with microwave sensors at the carved rock town Uplistsikhe, Georgia**](#)

Stefanie Fruhmann, Giorgi Basilaia, Mikheil Elashvili, Tea Munchava, and Oliver Sass

D1934

EGU2020-18511

Highlight

[**IoT systems for the study of cultural heritage monuments - case of Uplistsikhe, Georgia**](#)

Tea Munchava, Giorgi Basilaia, Nikoloz Vacheishvili, David Kvavadze, David Chkhaidze, and Mikheil Elashvili

D1935

EGU2020-16549

[Advanced multi-source approach for cultural heritage assessment and monitoring – the case study of the Corvin Castle and its surroundings](#)

Cristian Moise, Cristina Elena Mihalache, Luminita Andreea Dedulescu, Andi-Mihai Lazăr, Alexandru Badea, and Iulia Florentina Dana Negula

D1936

EGU2020-11214

Highlight

[Identifying Heritage Sites using Data Fusion on Location of Spiritual Sites and Geodata: A Case Study of Archeological Investigations in Brunei Darussalam](#)

Kazimierz Becek, **Khairunisa Ibrahim**, and Joanna Krupa-Kurzynowska

D1937

EGU2020-19773

[Assessing geo-hydrological hazards with Remote sensing data in Antananarivo \(Madagascar\) historical center](#)

Andrea Ciampalini, William Frodella, Daniele Spizzichino, Claudio Margottini, and Nicola Casagli

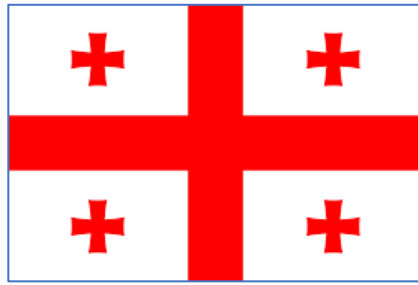
SHARING GEOSCIENCE ONLINE

Sharing Geoscience Online

European Geosciences Union general assembly 2020 Session NH6.4 “Remote Sensing & Cultural Heritage”

Conveners: Dr. William Frodella, Dr. Daniele Spizzichino,
Dr. Andrea Ciampalini, Prof. Mikheil Elashvili

Contributions



Threats to tangible cultural heritage (TCH)



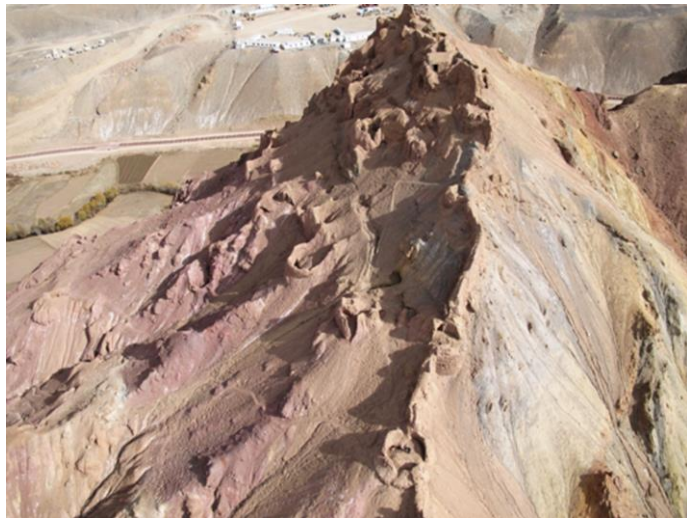
Landslides



Floods



Earthquakes



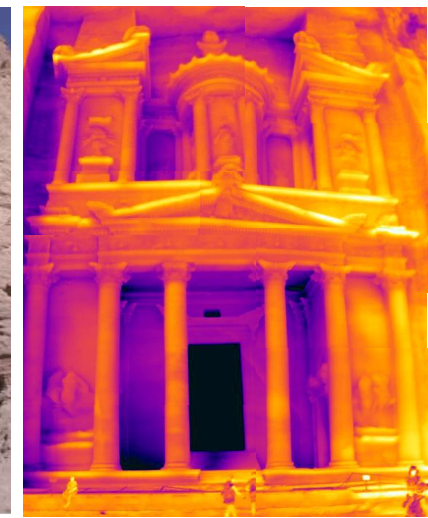
Soil erosion



Fire



War/sabotage



Anthropic pressure

Policies for TCH protection and conservation strategies

Sendai Framework for Disaster Risk Reduction

2015 - 2030



Priority 1 Understanding disaster risk

Policies and practices for DRR should be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment.

Priority 2 Strengthening disaster risk governance to manage disaster risk

Disaster risk governance at the national, regional and global levels is of great importance for an effective and efficient management of disaster risk.



SUSTAINABLE DEVELOPMENT GOALS



Interdisciplinary approach for TCH protection

INVESTIGATIONS



1

DIAGNOSIS



2

RISK REDUCTION

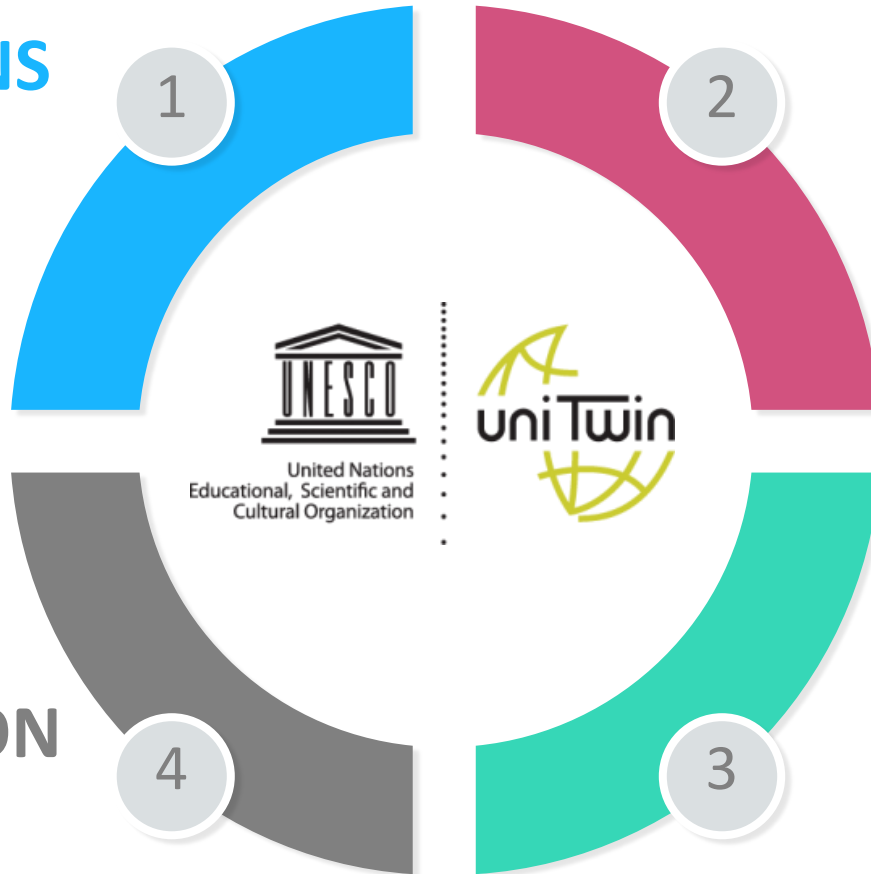


4

MONITORING



3



Remote sensing techniques for TCH protection, conservation and management plans

