

SATCULT

SATELLITE DATA FOR HERITAGE PROTECTION



HOW CAN CULTURAL HERITAGE INSTITUTIONS BENEFIT FROM SATELLITE DATA?



In the protection of cultural heritage, it is time to reach for the stars by making use of satellite data and earth observation.

The European **SATCULT** project is laying the foundations for this. It is an invitation to all experts and practitioners from the cultural heritage sector and from earth observation to familiarise themselves with new interdisciplinary possibilities in the protection of cultural heritage and in new cooperation and business fields.

Curious to find out? Then follow **SATCULT** on the way to the stars!

CULTURAL HERITAGE IN DANGER: CLIMATE DISASTERS

The protection of cultural heritage is increasingly struggling with climate disasters and emergencies:

- The archive of 20th century composer Arnold Schönberg in Los Angeles, California, was almost destroyed by **devastating forest fires** in January 2025.
- A **ten-minutes hailstorm** destroyed the roof and all the roof tiles of the 1,250-year-old former Benedictine monastery Benediktbeuern (Germany) in August 2023. Historic windows with original glazings were crushed by the storm, causing hundreds of windows to break.
- **Catastrophic flooding** in August 2023 resulted in the loss or almost irreparable damage to hundreds of city archives in the Austrian-Slovene border area.

Extreme weather events can hardly be prevented, but damage prevention is possible, for example through satellite data. However, the far-reaching possibilities of earth observation are still not used in the protection of cultural heritage.

Satellite data is available in high resolution and free of charge through the European Union earth observation programme Copernicus. This means that severe weather incidents can be accurately predicted in terms of scope and time horizon, and, in combination with an action plan and qualified personnel, preventive measures can be taken. However, heritage professionals and practitioners know little about accessing and analysing satellite data, and earth observation experts rarely cooperate with cultural heritage institutions.

SATCULT aims to bring these two fields of work and professions together.

<https://www.copernicus.eu/en>



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Could the described destruction of the monastery and the archives have been avoided or mitigated? Yes, say the experts of earth observation!

CULTURAL HERITAGE IN DANGER: LOOTING AND ILLEGAL TRADE

Political crises, economic emergencies and not least terrorist organisations destroy cultural heritage and make it difficult to monitor sites relevant to cultural history (e.g. archaeological excavations). The trade in illegally excavated objects is a lucrative business for unscrupulous traders. From the Near and Middle East to Asia and Latin America to Africa, the cultural heritage of humanity is threatened by piracy, looting and illicit trafficking.

It is estimated that the turnover of the illicit trade in cultural goods is in the billions every year. The cultural loss is immeasurable. Many findings and connections are lost to science and the public. This is also an issue in Europe: Self-proclaimed amateur archaeologists, for example, use probes to search for missing 'treasures' and thereby destroy important find contexts.



The UNESCO 1970 “Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property” is an obligation under international law to take action against the illicit trade in cultural heritage and to return illegally exported cultural property.

Several European research projects have shown that e.g. excavations can be traced by satellite images in close chronological order, e.g. by earth movements. Accordingly, measures such as police interventions to protect excavations can be organised in a timely manner.

Examples of such research projects are currently being prepared by **SATCULT** for publication. Cultural heritage experts and earth observation professionals alike are invited to make such projects available to the relevant professional communities in order to use such examples to demonstrate the far-reaching possibilities of earth observation in the protection of cultural heritage. More: <https://www.unesco.org/en/legal-affairs/convention-means-prohibiting-and-preventing-illicit-import-export-and-transfer-ownership-cultural>

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Can looting be detected at an early stage in order to enforce protective measures? Yes, say the experts of earth observation!

CULTURAL HERITAGE IN DANGER: OPTIMISE COLLABORATION VIA SATELLITE DATA

According to UNESCO, the Russian war of aggression in Ukraine has so far caused estimated damage of more than 3.5 billion Euros to the country's cultural heritage. More than 350 monuments have been damaged, some of them completely destroyed. The war in Ukraine is a sad example of how acts of war as in all military conflicts harm cultural heritage as an expression of national identity.

International teams of experts strive to assess damage and weigh preservation measures. This is not always possible on the ground, either because acts of war make access impossible or because they are restricted areas due to backlogs of military operations. Insights into the situation on the ground are necessary in order to assess damage and, for example, to organise relief supplies such as instruments and materials for restoration.

High-resolution satellite images can show the condition of e.g. building damage such as collapse hazards, spilled building parts or fire ruins from different angles and several meters into the ground. Such images can be taken briefly in succession to document damage developments. Satellite images allow international teams to exchange information online and discuss preventive measures without having to put themselves in danger on the ground.

More:

<https://www.unesco.org/en/articles/damaged-cultural-sites-ukraine-verified-unesco?hub=701>



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Can interdisciplinary teams make assessments using satellite data? Yes, say the experts of earth observation!

REACHING FOR THE STARS: HOW THE CULTURAL HERITAGE SECTOR CAN BENEFIT FROM SATELLITE DATA

The manifold possibilities of using satellite images have not yet arrived in the cultural heritage sector. The European project **SATCULT - Vocational Training closes the knowledge gap on satellite-based services for the preservation of cultural heritage** (2024-2026) will change this.

Funded by the European ERASMUS+ programme, **SATCULT** is a opportunity to make professionals working in cultural heritage protection, networks and initiatives and their education providers aware of the immense potential of earth observation data and how to translate the data into concrete action. Despite the many opportunities, there is currently no vocational training program that qualifies accordingly.

The German-Italian-Cypriot partnership focuses on practical support measures:

- Identification of the qualification needs of staff in public and private cultural heritage institutions through a Europe-wide survey,
- Recording of good practices of heritage protection activities based on earth observation data in a database,
- Definition of the learning content and skills needed to benefit from the data,
- Europe-wide communication of opportunities,
- Compilation of a pool of European experts from satellite-based geo-information services that can support cultural heritage institutions.



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READY FOR BENEFITTING FROM SATCULT?

In a first step, cultural heritage and earth observation professionals are invited to communicate good practices in the use of earth observation data in cultural heritage protection. If you are a professional in one of these fields, please fill in a template with relevant data about your good practice:

<https://forms.gle/JeFy7qQeR8oiSX87A>

Deadline: March 15th, 2025

The **SATCULT** team together with the Advisory Board will collect good practices to be communicated Europe-wide. Of particular interest are examples from the heritage sector beyond archaeology (where the use of satellite data is rather advanced).



Good practices speak for themselves. It is therefore important to find such examples, present them and thus show the great potential of earth observation for the protection of cultural heritage.

They exist, these good examples, at a few locations in Europe.

Regardless of whether they are research or application projects, they are all welcome to be presented and communicated in the **SATCULT** brochure and an online databank on the **SATCULT** homepage. Please help to create the first collection of good practices Europe-wide! Preparing them also involves finding out what skills are needed to implement such projects successfully and in a practice-orientated way.

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Please participate in the SATCULT survey and show your good practices!

GET IN TOUCH WITH US!

SATCULT partners:

- **media k GmbH** is a German social enterprise that has been actively involved as enabler, facilitator, and service provider in cultural heritage protection activities and the development of respective training for more than 25 years.
- **Consiglio Nazionale delle Ricerche (CNR) - Istituto di Scienze del Patrimonio Culturale** (ISPC - Institute of Heritage Sciences) is the CNR's Italian hub for research, innovation, training, and technology transfer in cultural heritage.
- **ERATOSTHENES Centre of Excellence (ECoE)** is a multidisciplinary research and innovation centre based in Limassol, Cyprus. It specialises in Earth Observation (EO), space-based monitoring, and related digital solutions that leverage cutting-edge engineering and expertise to address critical global challenges, including climate change, environmental sustainability and cultural heritage preservation.

Interested to stay in touch? Please ask to be included in our communication activities:

<https://www.satcult.eu;>

<https://www.linkedin.com/groups/13118904/>

Dr. Karin Drda-Kühn (coordinator)

satcult@media-k.eu

+49 7931 992730

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The high-class SATCULT European Advisory Board

Additional expertise from Germany, Italy and Cyprus is involved:

- **Patricia Alberth** is Director of State Palaces & Gardens Baden Wurttemberg / Germany
- **Daniele Gardiol** is an astronomer and researcher at INAF - Istituto Nazionale di Astrofisica in Turin / Italy.
- **Margherita Sani** is a project coordinator at NEMO - Network of European Museum Organisations and is based in Italy
- **Chrysanthos Pissarides** is president of the Cyprus Branch of ICOMOS.



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