#EUSpace

for cultural preservation

Copernicus is Europe's EO[1] programme, providing open-access data about our planet.

While widely used for environmental monitoring, disaster management, and urban planning, Copernicus also offers powerful tools for cultural preservation. Through its network of Sentinel satellites, it provides high-resolution imagery and analytical capabilities that help monitor cultural heritage sites.

Copernicus enables authorities and researchers to protect monuments, archaeological landscapes, and historical sites from environmental threats, urban sprawl, climate change, and conflicts.

How is it used? Key tools and products include:

Natural subsidence and ground motion detection

Detect structural instability and ground shifts.

Risk assessment maps

Identify areas vulnerable to natural and man-made disasters or environmental stressors.

Urban sprawl monitoring

Tracks urban expansion near heritage sites.

Climate change indicators

Assess long-term climate risks.

Air pollution monitoring

Detects impacts of pollution on monuments and sites.

Coastline monitoring (erosion)

Protects coastal heritage from rising seas or erosion.

Bathymetry

Measures water depth to manage underwater cultural heritage and port sites.

Land cover and Land use changes

Analysis of changes in the built in and natural environment.

Applications in Archaeology

- **Discovery and mapping:** Copernicus data can support new sites discovery and map known ones, and help suggest the presence of those hidden underground.
- **Site monitoring:** Time-series data allows monitoring of seasonal and environmental changes, reducing the need for extensive fieldwork.
- **Risk management:** Copernicus helps assess risks from urban sprawl, land use and land cover changes, coastline erosion, ground motion, and air pollution.
- **Data analysis:** Vegetation, moisture, and other indicators in satellite imagery can signal buried archaeological features.
- **Preservation:** Rapid damage mapping and long-term monitoring help safeguard sites during natural disasters or conflicts.

[1] Earth Observation.

Challenges and solutions

- **Limited budgets and resources:** Copernicus data support managers to prioritise conservation efforts and optimise resources.
- **Conflict damage:** Very high resolution satellite imagery enables digital inventories of sites and **post-conflict damage assessment.**
- **Remote locations:** The use of high resolution satellite imagery ensures access to cultural heritage even in hard-to-reach areas.

Examples from the field

In Rhodes, Copernicus data monitor settlement pressures on cultural sites

Using Copernicus data to safeguard cultural heritage

January 2022

In Central America, Sentinel-1 satellites helped identify Maya ruins covered by jungle

Identification of Maya ruins covered by jungle using Sentinel-1

08 February 2024

In Cyprus, Copernicus images mapped earthquake damage to UNESCO World Heritage Sites

The Use of Sentinel-1 SAR Images and OS Software for Cultural Heritage

26 July 2019

World Heritage Hub

Developed by EUSPA, the World Heritage Hub is a web portal serving as unique access point to Copernicus data products and services relevant to cultural and natural heritage. It features interactive tools and datasets from various Copernicus services, supporting evidence-based monitoring, conservation, and management of heritage sites across the globe.

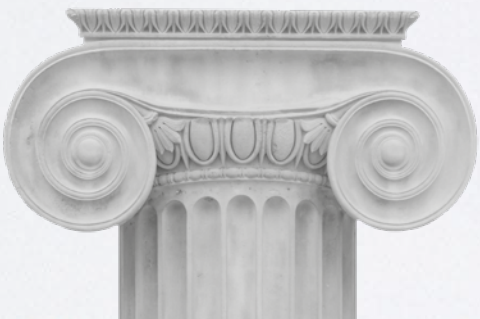
The World Heritage Hub's goal is to empower decision-makers, researchers, and site managers with the tools they need to track changes, assess risks, and preserve the world's cultural and natural legacy for future generations.

World Heritage Hub Data Viewer

The WHH Data Viewer brings together datasets from multiple Copernicus services to help stakeholders monitor, manage, and preserve cultural and natural heritage sites around the world.

EUSPA's role

- Ensures reliable satellite data access and promotes its uptake across sectors, including cultural heritage
- Facilitates collaborations among EU institutions, member states, NGOs, international organisations and research centres to develop EO-based tools for heritage monitoring
- Strengthens Europe's ability to preserve its cultural legacy using cutting-edge space technology through pilot projects, capacity-building initiatives, and funding support



www.euspa.europa.eu

#EUSpace

Published in 2026