

Submerged Heritage at Risk: The Impact of Global Climate Change

Global warming is causing an increase in the frequency of extreme weather events such as heatwaves, heavy rainfall, and prolonged droughts. This poses a significant risk to the conservation of archaeological heritage.

Submerged heritage, characterized by the preservation of organic matter, can be affected as conditions and the environment in which it has been preserved change. Groundwater and continental mass levels can vary, as well as water temperature.

Organize



Promote





The WOODPLAKE Project

The objective of the project is to measure the effect of climate change on submerged archaeological sites in order to identify and manage their vulnerability and explore solutions to mitigate the impact of climate change and ensure their protection.

The project has selected three prehistoric settlements: the Neolithic site of la Draga in Lake Banyoles, and the Bronze Age and Iron Age sites in Lake Bolsena and Lake Mezzano in central Italy. Analyzing these three case studies allows for an assessment of the specific impact of climate change and global warming on their conservation, particularly regarding their exceptionally preserved organic materials.

Who participates in this project?

The WOODPLAKE project, “Archaeological Wooden Pile-Dwelling in Mediterranean European lakes: strategies for their exploitation, monitoring and conservation,” has been funded under the Joint Projects in Cultural Heritage Hub. It is coordinated by the University of Tuscia (Italy) and involves the participation of the Autonomous University of Barcelona, CEA-Grenoble/ARCNuclear (France), the Istituto Superiore per la Conservazione ed il Restauro (Rome, Italy), the Spanish National Research Council (IMF, Barcelona), the Museum of Archaeology of Catalonia, and the Archaeological Museum of Banyoles.



The case of the Neolithic site of la Draga

The partially submerged Neolithic settlement of la Draga is located between the waters of the lake and the groundwater along its shore. The permanent humidity of the archaeological layers has contributed to the exceptional preservation of organic materials, including wooden objects, basketry, and remnants of wooden architectural structures dating back over 7,400 years.

Specific objectives of the project:

- Understand wood preservation conditions through analysis of the chemical composition of water and sediments where the remains are located.
- Assess the state of wood preservation by measuring its chemical composition.
- Establish the relationship between current extreme weather events in the surrounding area of Lake Banyoles and their impact on water level fluctuations and groundwater.
- Measure the effect of water level variation in the lake on the groundwater level through periodic monitoring of water levels.
- Determine the areas of the site most affected by water level fluctuations.



Preliminary results from the study of groundwater level variation in the lake

Periodic measurements of the lake and groundwater levels taken since 2021 show a seasonal variation in groundwater of over one meter. This variation correlates with fluctuations in the lake's water level.

The drop in groundwater level significantly affects the sectors of the site that are farther away from the lake shore, where thousands of wooden piles, over 7,000 years old, are preserved.

In light of this situation, the upcoming archaeological excavations at la Draga aim to assess how this variation has affected the preservation of organic materials in the most critical areas and determine the most immediate risks. This will enable the evaluation of possible mitigation measures.