

WOODPDLAKE

Archaeological Wooden Pile-Dwelling in Mediterranean European lakes: strategies for their exploitation, monitoring and conservation



Presentation of the Project

STATE OF THE ART

Wooden pile dwellings (WPD) are an inexhaustible and precious source of information on landscape evolution and contingent cultural activities. There have been significant investigations on WPD submerged in Alpine areas, but important knowledge **gaps** are evident regarding Mediterranean volcanic and karstic lakes. Wood from pile dwellings is **waterlogged**, and its conservation mostly depends on the surrounding environment, i.e., sediments and water quality.

ISSUES

The **conservation** of this sites is endangered by the **climatic change** impacts and **anthropogenic pressure**, further exacerbated by the **sensitive** and circumscribed lake environments.

CASE STUDIES

3 case studies:

- Lake of **Banyoles** in Spain;
- Lakes of **Bolsena** and **Mezzano** in Central Italy.



Objectives of the Project

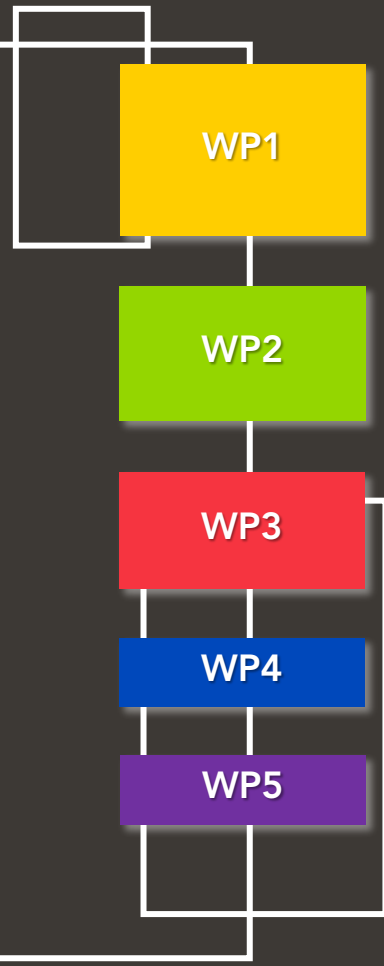
MAIN OBJECTIVE

Assess the impact of climate change and extreme climate events on the conservation and safeguard of pile-dwellings in Mediterranean lakes.

SPECIFIC OBJECTIVES

- 1) Establish and improve the knowledge base of **Wooden Pile-Dwelling** (WPD) in lakeside environments of volcanic and karstic-tectonic origin in the Mediterranean coastal and inland areas in order to understand the sites' formation processes and the implications for site conservation.
- 2) Capitalize existing information on the selected case studies and establish a **network of researchers** studying lake environments, and combining results obtained by different disciplines will be in order to assess the impact of the current climate on **lake and on pile-dwellings' conservation**. We would also like to assess the evolution of past climate conditions, with the possibility of formulating future scenarios.
- 3) Identifying daily monitoring processes to verify the effect of extreme climate events on the surrounding environment and to evaluate their effects on the **sediment** and the state of conservation of the **archeological settlements**.
- 4) To support innovative methodologies in wood research in cultural heritage, like isotopes.
- 5) Increase local awareness (especially amongst stakeholders) on the historical, cultural and environmental value of the cultural wooden goods and establish a participatory decision-making process. We envision actions for the preservation and safeguard of this cultural heritage.

Research Methodology



WP1 Collecting all relevant information from archeological and environmental studies performed to date, assemble current data set and to fill in knowledge gaps. Dendrochronology and isotope, archeology, information on palynology.

WP2 Wood Degradation (gravimetric method, GC-MS-PY, FRIT, NMR) for pile-dwelling preservation and conservation. Sediment and water analysis.

WP3 Micro-cosmos environment which accelerates the ageing of wood.

WP4 Wooden artifacts' post-excavation assessment of restoration and conservation impact.

WP5 Dissemination communication.

Activities

		Bolsena and Mezzano lakes	Banyoles lake
Exploitation	Palinology	Roma 1	UAB
	Achaeology	Soprintendace, ISCR	UAB
	Dendrochronology	UNITUS	UAB
	Dendroisotopic content	UNITUS	UAB
	Wood identification	All partners	All partners
	Landscape and climate reconstruction	UNITUS	UAB
	Field campaigns	UNITUS feat. SSB	UAB
	Monitoring by probes	UNITUS feat. FOS GROUP	
	Sediments characterization	UNITUS	UAB
	Environmental and water quality	UNITUS	UAB
Environmental monitoring	Acquarium-microcosmo	UNITUS	UNITUS
	Mapping WPD sites by UVA	UNITUS	UNITUS
	Wood degradation analysis	UNITUS	ISCR,UNITUS, CEA-Grenoble
	Testing nanomaterials	ISCR- UNITUS, CEA-Grenoble	ISCR- UNITUS, CEA-Grenoble
	Restored wood analysis	ISCR	CEA-Grenoble
	Artificial aging	ISCR- UNITUS, CEA-Grenoble	ISCR, UNITUS, CEA-Grenoble
	Comparison with glacial lakes	All partners	All partners
	Best practise for wood conservation	All partners	All partners
	Innovative material	UNITUS	UNITUS
	Capitalization of the results	UNITUS, stakeholders committee	UNITUS, stakeholders committee
Conservation and restoration	Interdisciplinary studies	UNITUS, stakeholders committee	UNITUS, stakeholders committee
	Best practise for wood conservation	SC, STC	SC, STC
	Forecasting scenarios	All partners	All partners
	Final activities		

Expected Impacts

SCIENTIFIC IMPACT

How waterlogged wood interrelates to the surrounding environmental conditions. The concrete impact of climate changes on waterlogged wood, providing also the correlation with the lake ecosystems in the Mediterranean are.

TECHNICAL IMPACT

Restoration experiments will be compared with the performance of previously restored artefacts.

POLITICAL IMPACT

Involvement of citizens and policymakers will be encouraged at different levels: Decision-makers, museum professionals, journalists and local educators, to engage them as active stakeholders.

CROSS-CUT IMPACT

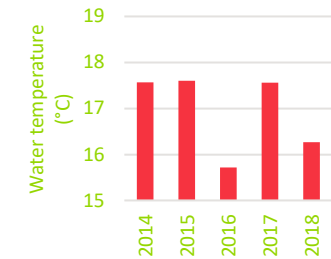
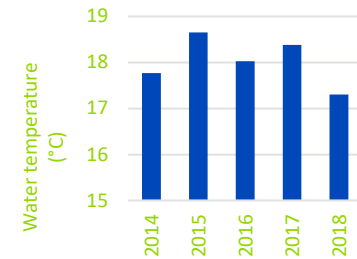
Different disciplines (environmental, historical researches, etc.), environmental data acquisition has been carried out sometimes by different organisms (municipalities, deputy environmental agencies, researchers, etc.). The results of the research can be included in a network of proxy data (BIG DATA and meta data).

FIRST RESULTS (Italy)

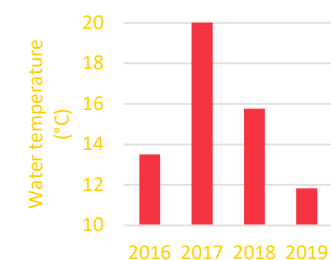
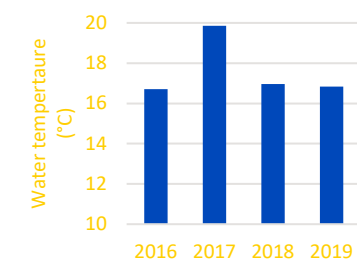
Annual mean for shallow waters (0,5 m)

Annual mean for Photic/Epilimnion (5-20 m)

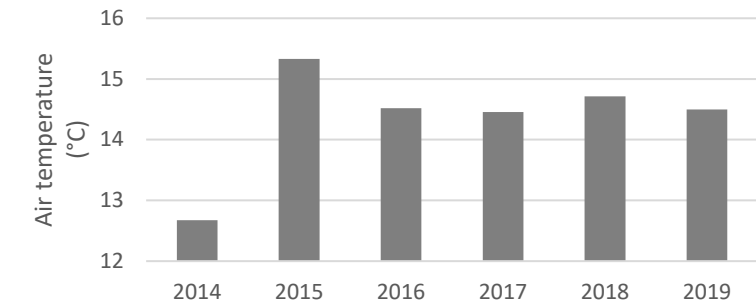
BOLSENA Lake



MEZZANO Lake



BOLSENA - Air temperature



THANK YOU FOR YOUR ATTENTION!

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WOODPDLAKE Partners

