

Geoarchaeology of coastal transitional geomorphic systems

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The Project

The PhD project focuses on the analysis of the geomorphological and environmental evolution of selected archaeological sites located along the lagoon and deltas of the Northern Adriatic coast, spanning from the Bronze Age to the Middle Ages (e.g., Aquileia, Concordia Sagittaria, Altino, Jesolo, Adria, Comacchio). Aim of the project is to reconstruct the physical landscape in defined chronological intervals and to analyze the strategies adopted by the different cultural and societal entities to cope with relative sea-level rise and palaeohydrographic variations related to river avulsion in deltas.

The PhD candidate will process and interpret remote sensing images, Digital Terrain Models and historical cartography, carry out field survey with the description and sampling of stratigraphic sections and cores, participate to archaeological excavations and surveys. The reconstruction of the chronological framework will rely on radiocarbon dating, OSL dating and archeological evidence.

Background

The geoarchaeological investigation of transitional coastal environments has received increasing attention in the last decades. This is certainly due to a rising interest in the long-term interaction between human societies and the environment, as well as compelling concern on the impact of predicted relative sea-level rise on coastal areas in future Global Change scenarios, which will demand a leap in the resilience of local communities to rapid environmental changes.

Landscape evolution in low coastal areas is controlled by several intervening processes. The primary driving factor is represented by the relative sea level elevation, which provides the base level for the terminal tracts of the fluvial system and connected deltas and estuaries. Sea-level variations also control the space available for the activity of coastal processes related to waves, marine water circulation, and tides, and the development of barrier-lagoon systems. All these processes are highly dynamic and, through the erosion, transport, and deposition of sediments, continuously shape the physical landscape at time scales ranging from few hours during sea-surges, to 10^3 - 10^5 years in relation to glacio-eustatic fluctuations and geological land subsidence.

Such geomorphic setting implies that the exploitation and settlement of low coastal areas by humans has always had to cope with a very unstable and challenging environment. On the other hand, the coastal swamps, marshes and lagoons, though subject to diseases such as malaria and cholera, provide large availability of natural resources for basic human needs, e.g., fishing and hunting grounds, wild crops, livestock pasture, salt production and, in the higher-lying areas along fluvial ridges, fertile land. Furthermore, the presence of river mouths generally allows good connections with the interior for the exchange of goods at local scale, as well as for broader regional commercial maritime routes. In fact, the majority of low coastal areas in the world have been inhabited since early prehistory and hosted important ancient civilizations.

References

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