Deciphering the buried geoarchaeological landscapes of the Venice Lagoon

Proposers: prof. Paolo Mozzi (University of Padova), prof. Carlo Beltrame (Ca' Foscari University of Venice)

Background

Lagoons are dynamic geomorphic systems that depend on the interaction among several processes such as relative sea level rise, longshore drift and sediment input, wave and wind direction and intensity, recurrence and magnitude of extreme events and sea surges. Lagoon sedimentary successions provide continuous archives of environmental change that reflect the autocyclic processes typical of the barrier-lagoon system (e.g., migration of tidal channels and inlets, ebb and flood tidal delta progradation, occurrence of washovers). As well, they are capable of recording the system response to allocycling forcing at scales that range from local (e.g., shift of major river mouths into or nearby the lagoon, differential geological subsidence), to regional and global (e.g., eustacy and climate).

Lagoons are very productive loci of biodiversity, placed at the intersection of different ecological niches: those dominated by marine processes and environments, and those pertaining to the backing continental areas such as floodplains and freshwater swamps. Their resources have long been exploited by human communities primarily for hunting, fishing and mollusk gathering, as well as, in more complex societies, for specific economic needs of salt production and fish farming. With the development of seafaring and marine trading routes from the late prehistory onwards, lagoons have been offering shelter and harbor for coastal navigation along otherwise unprotected, low sandy coasts. The Venice Lagoon in northern Italy is a paradigmatic case study of the long-lasting colonization and exploitation of a vast barrier-and-lagoon system. It has long been inhabited starting from the Iron Age at the least, and the anthropogenic impact on the natural system has become overwhelming during the last centuries.

A geoarchaeological approach to the study of the Venice Lagoon is capable of offering extraordinary insights on past landscape changes, highlighting how environmental trends shaped appropriate adaptive strategies and resilience by human communities that opted to live in these territories, subject to sudden shifts from metastable equilibrium to instability. Conversely, geoarchaeology (i.e., the interdisciplinary approach to the study of the relation between humans and the environments of the past, that focuses on the application of geoscience to the understanding of archaeological problems) allows to reach a wider comprehension of the long-term anthropogenic impact on the landscape, be it intentional or unintentional.

Aims and methods

The PhD candidate will focus on the reconstruction of the Venice lagoon palaeogeography and palaeoenvironments in different time slices, with specific focus on major archaeological sites. She/he will investigate the processes that led to the formation of the archaeological record, highlighting sin- and post-depositional natural forcing and ongoing and future threats to the preservation of the buried and/or submerged archaeological structures. She/he will have the possibility of concentrating on the analysis of specific palaeoenvironmental proxies at the laboratories of the Universities of Padova and Ca' Foscari University of Venice, and in other research facilities in Italy and abroad.

Methods span from the processing and interpretation of remote sensing images and historical cartography to geological and geomorphological field survey, archaeological excavation, coring, sediment description and sampling, geotechnical and geochemical characterization of sediments,

geophysical survey, analysis of different environmental proxies such as pollen and macro/microfossils, radiocarbon dating. The ideal candidate may have either a geomorphological and sedimentological background, or a curriculum more oriented towards landscape and environmental archaeology. In both cases, she/he must have a genuine interest in, and attitude for, cross-disciplinary contamination finalized to the research goals.

Collaborations and funding

The PhD thesis will be carried out in the framework of ongoing joint investigations in the Venice Lagoon and surrounding areas by the Department of Geosciences of the University of Padova and the Department of Humanities of Ca' Foscari University of Venice. The investigation will benefit of funding from Prin (Mozzi) and PNRR (Beltrame) research projects in the Venice area, as well as DOR (Mozzi).