

EGU21-14754

<https://doi.org/10.5194/egusphere-egu21-14754>

EGU General Assembly 2021

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Middle-to late Holocene environmental changes based on a multi-proxy lagoonal record, Klisova lagoon, Greece

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Coastal wetlands are dynamic environments prone to climatic and anthropogenic forcing and ideal settings to study past climatic and environmental changes. In the eastern Mediterranean region and particularly in Greece, the climate presents high spatiotemporal diversity, while human activity is a significant factor in shaping the landscape. This study presents a sediment record from Klisova lagoon, situated in central Greece, at the eastern part of Messolonghi lagoon complex. The area is recorded from antiquity to have great anthropogenic activity. The paleoenvironmental synthesis was based on standard sedimentological analysis (grain size, TOC, magnetic susceptibility), joint micropaleontological and palynological analysis, X-ray Fluorescence scanning, and radiocarbon dating. The Bayesian age-depth model is based on radiocarbon dating and yields an age of 4700 cal BP for the base of the recovered sediment sequence. For the last 4700 years, the freshwater influx, the progradation of the Evinos river delta and related geomorphological changes control the environmental conditions (e.g. depth and salinity) in the lagoon system. Prior to 4000 cal BP, a relatively shallow water depth, significant terrestrial/freshwater input and increased weathering in the lagoon area are inferred. Elemental proxies and increased dinoflagellate and foraminifera abundances, which indicate marine conditions with prominent freshwater influxes, point to the gradual deepening of the lagoon recorded at the drilling site up to 2000 cal BP. The marine and freshwater conditions equilibrium sets at 1300 cal BP, and the lagoonal system seems to reach its present state. Maxima of anthropogenic pollen indicators during the Mycenaean (~3200 cal BP), Hellenistic (~ 2200 cal BP) and Late Byzantine (~ 800 cal BP) periods suggest intervals of increased anthropogenic activities in the study area.