

Geoarchaeological evidence for rapid landscape change in western Turkey – the example of the Maeander (Büyük Menderes) delta

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During the last six millennia, the former marine embayment of the Latmian Gulf has been silted up by the progradation of the Maeander (Büyük Menderes) delta. Long-term human impact together with an ecologically unstable natural environment in the Mediterranean has led to strong erosion in the hinterland and the resulting delta progradation and gradual infill of the embayment.

Landscape history was assessed through the geological and geoarchaeological evaluation of the archives "alluvial plain" and "delta". More than one hundred sediment cores were taken by means of a percussion-coring device. Sedimentological, petrological and palaeoecological examination in the laboratory followed. The environment of deposition – i.e. marine, littoral, lagoonal, limnic or terrestrial – was ascertained by macro- and microfaunal analysis. Dating the cores with artifacts and the radiocarbon method led to the establishment of a chronostratigraphy. Having measured the position and altitude of the cored sites with differential GPS, the corings were synoptically composed in stratigraphic cross sections. Supplemented by input from archaeology and historical sciences, scenarios of the palaeogeographic evolution of the study area in different time slices were then developed.

Delta progradation initially occurred both in the central part and at the northern flank of the Latmian Gulf. The area to the northwest of the former island of Hybanda started to become landlocked as early as 1500 BC. The area of the Hellenistic Priene was reached in the 8th century BC. In contrast, the Myousian peninsula was located at the open sea until the Late Classical-Hellenistic period. This indicates an asymmetric delta growth, caused by a bifurcation of the Maeander River into a northern and a southern branch. At least until the Hellenistic-Roman period, the northern branch was dominating the delta progradation. Having passed Priene, it turned south, reaching the area of Miletos most probably in the Roman Imperial time. As a consequence, the southern part of the Latmian Gulf became separated from the open sea. In Byzantine times, it was gradually infilled by the sediments of the new southern branch of the Maeander. Today, the still brackish Lake Bafa is the last remnant of the former marine Latmian Gulf.

A close-meshed grid of corings in the vicinity of the ancient city of Priene rendered additional information about their possible harbour sites. The eastern embayment had already changed into a slightly brackish to freshwater lake when the city was founded anew ca. 350 BC. A connection to the open sea – probably *via* an anthropogenic canal – could not yet be discovered. This area was therefore not suitable as a harbour. Most probably the Late Classical – Hellenistic harbour was located in the embayment west of the promontory.

As for Miletus, our geoarchaeological research at the Temple of Athena and the Delphinium sites clearly shows that relative sea level was highest during Early and Middle Bronze Age (3000-2000 BC) when the transgression created an archipelago-like coastal landscape. Due to denudation processes and coastal dynamics it turned to the famous Milesian peninsula during the 2nd millennium BC. In Roman Imperial times the peninsula became landlocked by the prograding Maeander delta. By then, sedimentation rates were high triggered by the intensification of land use, clearing of forests, and livestock farming.

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