

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.

The historic delta growth of the Maeander River is one of the most spectacular cases of delta progradation in the Mediterranean region. The westward shift in the shoreline has been documented in the ancient literature (e.g. Herodotus, Strabo, Pausanias), by archaeological evidence from the former seaport cities Miletus, Priene, Myous and Herakleia, and by palaeogeographical studies (Brückner 2003, Brückner et al. 2002, 2005, Müllenhoff 2005). Lake Bafa, a brackish residual lake in the former southeastern part of the Latmian Gulf, also provides evidence of the shoreline changes (Müllenhoff et al. 2004).

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, followed by sedimentological, petrological and palaeoecological examination in the laboratory. The environment of deposition was ascertained by macro- and microfaunal analysis. Dating the cores with artifacts and the radiocarbon method led to the establishment of a chronostratigraphy. Supplemented by input from archaeology and historical sciences, scenarios of the palaeogeographic evolution of the study area in different time slices were then developed.

New results (Brückner et al. 2006) on the early palaeogeography and palaeoecology of Miletus are reported for the area around the Temple of Athena. The interpretation of several cores clearly show that during the Late Chalcolithic period it was possible to settle in the area around the later temple. Due to the progressive postglacial sea level rise, lower parts of the Late Chalcolithic settlement were then flooded and people had to move to higher grounds. We conclude that relative sea level was highest during Early and Middle Bronze Age (3,000-2,000 BC) when the transgression created an archipelago-like coastal landscape. This is confirmed by the Holocene sea level curve for the whole of the lower Büyük Menderes Delta and Floodplain since it also peaks around 2,500 BC (Müllenhoff 2005).

Archaeological remains indicate that at 1,700 BC it became possible to resettle the area. This implies that in the meantime relative sea level had fallen which is also shown by regressive and littoral sediments encountered in the cores. Due to this regression, increasing denudation processes and coastal dynamics, the archipelago subsequently 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 especially high triggered by intensive land use, clearing of forests, and livestock farming.

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