# COASTAL EVOLUTION IN WESTERN ANATOLIA DURING THE LAST FIVE MILLENNIA

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**Abstract**

The progradation of the Büyük Menderes delta and floodplain during the last 5000 years led to the total silting up of the former Latmian Gulf. By geoarchaeological means this delta growth is reconstructed in space and time, and the results then cross-checked with information from archaeological and (pre-) historical sciences. As synthesis, a scenario for the landscape evolution during the last five millennia is presented.

*Keywords: Turkey, Büyük Menderes, Miletus, delta growth, geoarchaeology, Holocene.*

The delta regions of western Anatolia witnessed the strongest coastline changes during the Holocene. In this paper this is exemplified for the Büyük Menderes (Maiandros) delta and floodplain. The impact of these processes on the former harbour cities Myous, Priene and Miletos are especially of interest since they lost their economic and strategic basis due to the siltation of their harbours. The relevant references for this topic are summarized in Brückner (1) and Brückner *et al.* (2). The new scenario of the landscape evolution, based on our geoarchaeological data, is presented in Fig. 1.

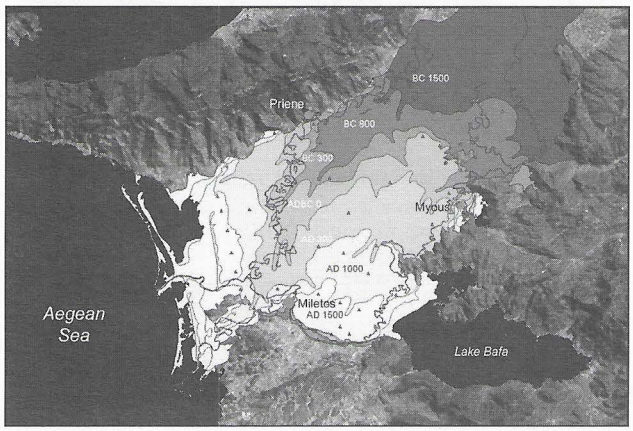


**Fig. 1. Progradation of the Büyük Menderes delta during the past millennia.**
**Note that during the peak of the Holocene transgression ca. 5,000-6,000 years ago, the marine gulf extended much further eastward covering the whole area of the floodplain visible in this figure. In the figure, a given age refers to its nearest seaward coastline.**

Potential Archaic to Classical Greek harbour sites were identified in the embayments west of the Myousian peninsula, i.e. between Castle hill and Settlement hill, and south of Settlement hill. In the vicinity of Myous, the transiton from marine to lacustrine facies must have occurred already in Hellenistic times. Lagoonal conditions prevailed in Hellenistic-Roman times. In the southwest, the lacustrine environment started in the 1st or 2nd century A.D. and partially prevailed until Modern times. In the east, the brackish and shallow Lake Azap is what remains of the former marine embayment.

Priene was founded anew in Late Classical time around 350 B.C. Under palaeogeographic perspective the most interesting question is that of the harbour site(s), a topic whereof the historic sources remain silent. Ceramic and $^{14}C$ stratigraphies of drill cores led to the following conclusions: In the eastern embayment, marine conditions prevailed at least until the 13th/12th century B.C. Thereafter, a slight regression can be proven by a peat dating from the second half of the 2nd millennium B.C. In the mid-4th century B.C, this embayment had already turned into a freshwater lake. For that time, a potential harbour site can be ascertained in the western embayment where water depth was still several metres and a lagoonal environment existed until the beginning of the Roman Imperial era. Definitely freshwater milieu did not exist before the 3rd century A.D. This embayment was filled with sediments more slowly than its eastern counterpart since it was sheltered from alluviation by the river due to the leeward position behind the promontory of the Priene rock.

During the peak of the Holocene transgression, the area of the later city of Miletos was composed of islands. One of them hosted the earliest settlement in the area of the later Athena Temple dating from the second half of the 4th millennium B.C. When the Minoan settlers arrived around 1900 B.C. this island topography is likely to have persisted; however, hints of an already existing connection with the adjacent mainland by a sandbar (tombolo) cannot be neglected. The palaeogeographic setting changed to a peninsula during the Minoan-Mycenaean occupation phase. The sediments were mobilized by coastal longshore drift and human-induced denudation from the adjacent slopes. It is at least since the Archaic period that the Milesian peninsula extending into the Latmian Gulf is known from literary sources and archaeologic evidence (city wall). The Roman time – and especially the Roman Imperial era – witnessed strong siltation processes around Miletos.

Tradition has it that the Milesian peninsula had four harbours, of which only the Lions' Harbour and the Theatre Harbour have been definitely identified to date. Our research in the Lions' Harbour showed an enormous increase in siltation between the 1st century B.C. and ca. A.D. 400. Corings within the Theatre Harbour unearthed no artifacts older than the Roman Imperial era; therefore, it must have been dredged in the 1st or 2nd century A.D. when also the theatre was renovated. The geoarchaeological approach also revealed that a good natural setting for the third harbour was given close to the earliest settlement near the later Athena Temple. Another potential harbour most likely existed to the east of the Milesian peninsula, in a leeward position to winds from the west.

The data set of archaeological and $^{14}C$ ages is suitable for the establishment of a locally valid sea level fluctuation curve for the Holocene. It seems to have a relative peak around 6-5 ka BP, after the strong late Pleistocene – Holocene sea level rise, and a relative low around 3 ka BP. This shape of this curve is similar to that of KAYAN (1995) established for the Troia (Troy) region. However, in our case this glacio-eustatic curve is shifted downward by the factor of 0.7 m/ka due to the ongoing subsidence of the Menderes graben. It is important to note that in several other regions of the Mediterranean, sea level reached its highest position during the Holocene only today and was definitely lower around 5 ka BP.

**References**

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