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Coastal Environmental Change  
During Sea-Level Highstands:  
A Global Synthesis with implications  
for management of future coastal change

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Quaternary coastal morphology and sea level changes



Project 437

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## Modelling coastal change in space and time: The example of the Büyük Menderes delta plain in Turkey

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### Abstract

This study aims to reconstruct the palaeogeography of the Büyük Menderes delta plain, with special focus on the environs of the ancient cities of Miletos, Priene und Myous. The geomorphological evolution will be presented in several time slices, starting ca. 5000 years ago. To reach this goal, a digital 3D elevation model was developed based on ERS Tandem radar data and satellite images.

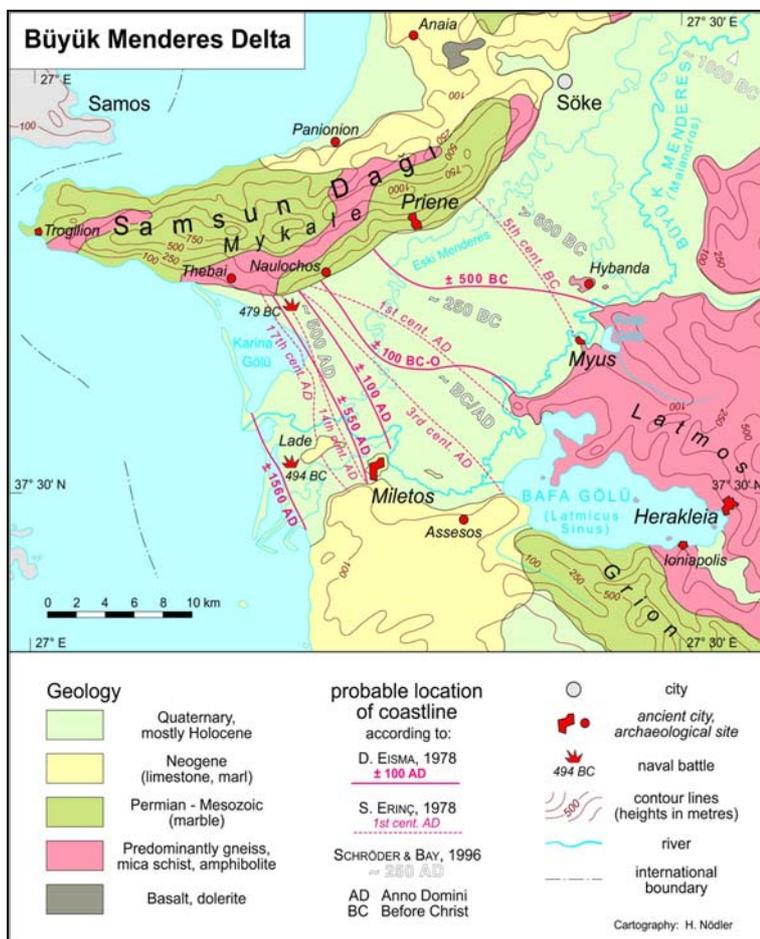
This is combined with a GIS. The palaeogeographic scenarios are derived from the analysis of ca. 200 percussion corings and their geoarchaeologic interpretation on the one hand, as well as from data of archaeology and historical sciences on the other.

The geoarchaeologic background is as follows (see also Brückner 2003, Brückner et al. 2001, 2002): as for Miletos, the first settlement, starting in the second half of the 4<sup>th</sup> millennium, was on an island in the area of the later Athena Temple.

The palaeogeographic setting changed to a peninsula during the Minoan-Mycenaean occupation phase. At the foot of Kalabak Tepe a harbour was identified which may have been still in use until the Roman era. Another potential harbour most likely existed to the east of the Milesian peninsula in a leeward position to winds from the west.

Corings in the famous Lions' harbour identified the so-called "moles" as brick debris, intentionally deposited in order to relocate the marble statues of the lions when the area had already turned into a swamp. In the eastern embayment of Priene, marine conditions prevailed at least until the 13<sup>th</sup>/12<sup>th</sup> century BC.

Thereafter, a slight regression can be proven by a peat dating from the second half of the 2<sup>nd</sup> millennium BC. When the late Classic – Hellenistic Priene was refounded (mid-4<sup>th</sup> century BC), the embayment had already turned into a freshwater lake. For that time, a potential harbour site can be ascertained only in the western counterpart where water depth was still several metres and a lagoonal environment existed until the beginning of the Roman Imperial era. Definitely freshwater can be proven not before the 3<sup>rd</sup> century AD.



In the vicinity of Myous, the transition from marine to lagoonal facies must have happened already in Hellenistic times. Potential Archaic to Classic harbour sites were identified in the embayments between Castle hill and Settlement hill, and south of the Settlement hill. In the 1<sup>st</sup>/2<sup>nd</sup> century AD, the lagoon turned into a freshwater lake which partially prevailed until Modern times.

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