

Häfen und Hafenstädte im östlichen
Mittelmeerraum von der Antike bis
in byzantinische Zeit.
Neue Entdeckungen und aktuelle
Forschungsansätze

*Harbors and Harbor Cities in the
Eastern Mediterranean from Antiquity
to the Byzantine Period:
Recent Discoveries and Current Approaches*

Band 1

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Hrsg. von
Sabine Ladstätter – Felix Pirson – Thomas Schmidts

Istanbul, 30.05.-01.06.2011



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Ephesos and its Harbors: A City in Search of its Place*

Martin STESKAL

Abstract

The development of the Ephesian landscape is marked by constant geomorphological and ecological changes. Amidst the constant and at times abrupt changes of the landscape a city like Ephesos was continually in search of the ›right‹ place. As a city of trade the Ephesian harbors were the pivotal commercial centers. Therefore the settlement history of Ephesos was always closely connected to the location of its harbors. The settlements had to frequently change their location to avoid

* The author would like to thank the organizers of this symposium as well as the director of the excavations at Ephesos, Sabine Ladstätter. Numerous helpful suggestions were made by Yaman Dalanay, Helmut Brückner, Ralf Urz, Friederike Stock and Michael Kerschner. I am grateful to them as well as Christian Kurtze for the production of the maps and Nicole M. High-Steskal for the revision of the English manuscript.

Abbreviations:

Friesinger – Krinzinger 1999

H. Friesinger – F. Krinzinger (eds.), 100 Jahre Österreichische Forschungen in Ephesos. Akten des Symposions Wien 1995, Archäologische Forschungen 1 = DenkschrWien 260 (Wien 1999).

Groh 2006 S. Groh unter Mitarbeit von V. Lindinger – K. Löcker – W. Neubauer – S. S. Seren, Neue Forschungen zur Stadtplanung in Ephesos, *ÖJh* 75, 2006, 47–116.

IvE Inschriften griechischer Städte aus Kleinasien 1–68 (Bonn 1972–2010): Ephesos (IvE I a–VII 2) Bd. 11, 1 (1979) – 17, 4 (1984).

Kraft et al. 2000 J. C. Kraft – İ. Kayan – H. Brückner – G. (Rip) Rapp Jr., A Geologic Analysis of Ancient Landscapes and the Harbors of Ephesos and the Artemision in Anatolia, *ÖJh* 69, 2000, 175–233.

Meriç 1985 R. Meriç, Zur Lage des ephesischen Außenhafens Panormos, in: *Lebendige Altertumswissenschaft. Festschrift Hermann Vetters* (Wien 1985) 30–32.

Scherrer 2007 P. Scherrer, Von Apaša nach Hagios Theologos. Die Siedlungsgeschichte des Raumes Ephesos von prähistorischer bis in byzantinische Zeit unter dem Aspekt der maritimen und fluvialen Bedingungen, *ÖJh* 76, 2007, 321–351.

Stock et al. 2014 F. Stock – M. Kerschner – J. C. Kraft – A. Pint – P. Frenzel – H. Brückner, The Palaeogeographies of Ephesos (Turkey), its Harbours, and the Artemision – a Geoarchaeological Reconstruction for the Timespan 1500–300 BC, *Zeitschrift für Geomorphologie* 58, 2, 2014, 33–66.

Zabehlicky 1995 H. Zabehlicky, Preliminary Views of the Ephesian Harbor, in: H. Koester (ed.), *Ephesos. Metropolis of Asia. An Interdisciplinary Approach to its Archaeology, Religion, and Culture*, *Harvard Theological Studies* 41 (Valley Forge 1995) 201–215.

Zabehlicky 1999 H. Zabehlicky, Die Grabungen im Hafen von Ephesos 1987–1989, in: Friesinger – Krinzinger 1999, 479–484.

losing access to the sea. A general tendency of a slow shift to the west has been documented. Although the harbors of Ephesos evoke only a rudimentary image in the minds of scholars' current geoarchaeological, geophysical and archaeological research has led to numerous new ideas that expand our knowledge. This paper addresses these new approaches to research.

Özet

Jeomorfolojik ve ekolojik değişimler, Ephesos ve çevresinin gelişiminde mütemadiyen etkili olmuştur. Sürekli ve kimi zaman ani bir biçimde meydana gelen bu değişikliklerin ortasında, Ephesos gibi bir kent devamlı gerçek bir yer bulma arayışındaydı. Bir ticaret kenti olarak Ephesos'un limanları ticaret merkeziydi. Bu nedenle Ephesos'un yerleşim tarihi ve limanlarının yeri birbirine sıkı sıkıya bağlıdır. Deniz ile bağlantısını kaybetmemek için yerini sürekli değiştirmiş olan yerleşimin yavaş yavaş batıya kaydığı saptanmıştır. Ephesos'un limanları, bilim adamları üzerinde her ne kadar gelişmemiş bir imaj yaratıyorsa da, son jeoarkeolojik, jeofizik ve arkeolojik araştırmaları, bilgilerimizi genişletecek çok sayıda yeni fikir ortaya çıkarmıştır.

Bu yazı, sözkonusu araştırmalardaki yaklaşımları içermektedir.

The development of the Ephesian landscape is similar to that of many other cities in western Asia Minor: it is marked by constant geomorphological and ecological changes (**Fig. 1**). Complex processes of sedimentation and erosion as well as shifting ground and sea water levels lead to these continual shifts. Sedimentation processes are typically linked to a rise in sea water levels which slow down the streams and rivers and hamper the discharge of solids into the ocean. Erosion processes though stem from human influences on the environment: massive deforestation, irrigation and agricultural use of land greatly affect the development of the landscape¹.

A short climb to the top of the seating section of the theater allows for a view of the silted plain that separates the ancient city from the sea. This vantage point provides the viewer with a better understanding for the interaction between natural forces and human activity which shaped the landscape through habitation and economic exploitation (**Fig. 2**). Amidst the constant and at times abrupt changes of the landscape a city like Ephesos



Fig. 1 View of the Roman harbor of Ephesos to the east (N. Gail © OEAI)

¹ Cf. Scherrer 2007, 323; A. Bammer – U. Muss, *Das Artemision von Ephesos. Das Weltwunder Ioniens in archaischer und klassischer Zeit* (Mainz 1996) 21–24; A. Bammer, *Ephesos. Stadt an Fluß und Meer* (Graz 1988) 76–82.



Fig. 2
View of the Roman
harbor of Ephesos
to the west
(N. Gail © OEAI)

was continually in search of the ›right‹ place. Due to the constant changes smaller settlements along the coast had to frequently change their location to avoid drowning or losing access to the sea and harbor. A general tendency of a slow shift to the west has been documented.

The coastal line in the bay of the Küçük Menderes (the ancient Cayster River) has changed greatly from the Neolithic period (**Fig. 3**), over the Roman Imperial period (**Fig. 4**) until today (**Fig. 5**). The situation of the population becomes more understandable if these significant changes are fully considered: in the Neolithic period the bay reached up to 18 km inland while today through the gradual sediment infill, 5 km separate Ephesos from the sea.

The reasons for the prosperity of Ephesos are threefold: the sanctuary of Artemis, the rich and fertile *hinterland* and the harbor as pivotal commercial center where products were exported to the east and imported from the west of the empire. Ephesos was the final stop of an important caravan route that transported products from Anatolia and the Near East. These products were then redistributed to the entire Mediterranean².

From a scientific standpoint the harbor of Ephesos evokes only a rudimentary image in the minds of scholars. We owe our expanding knowledge to the efforts of the paleogeographic research by J. Kraft, İ. Kayan and the team of H. Brückner³ and to the excavations of

² Cf. Zabehlicky 1999, 480 f.; Scherrer 2007, 321.

³ Cf. e. g. Kraft et al. 2000, 175–233; İ. Kayan, Alluvial Geomorphology of the Küçük Menderes Plains and Geo-Archaeological Interpretations on the Site of Ephesos, in: Friesinger – Krinzing 1999, 373–377; J. C. Kraft



Fig. 3
The bay of
Ephesos. The
coastal line in
the Neolithic/
Mid-Holocene
period
(Ch. Kurtze
© OEAI, based
on Kraft et al.
2000, 209 fig. 5)



Fig. 4
Coastal line of
Ephesos in the
Imperial period
(C. Kurtze
© OEAI, based
on Kraft et al.
2000, 229 fig. 15)

– H. Brückner – İ. Kayan, Paleogeographies of Ancient Coastal Environments in the Environs of the Feigengarten Excavation and the ›Via(e) Sacra(e)‹ to the Artemision at Ephesos, in: P. Scherrer – H. Taeuber – H. Thür (eds.), *Steine und Wege. Festschrift Dieter Knibbe*, *SoSchrÖAI* 32 (Vienna 1999) 91–100; J. C. Kraft – İ. Kayan – H. Brückner, The Geological and Paleogeographical Environs of the Artemision, in: U. Muss (ed.), *Der Kosmos der Artemis von Ephesos*, *SoSchrÖAI* 37 (Vienna 2001) 123–133; J. C. Kraft – İ. Kayan – H. Brückner, The Sea under the City of Ancient Ephesos, in: B. Brandt – V. Gassner – S. Ladstätter (eds.), *Synergia. Festschrift Friedrich Krinzinger I* (Vienna 2005) 147–156; J. C. Kraft – H. Brückner – İ. Kayan – H. Engelmann, The Geographies of Ancient Ephesos and the Artemision in Anatolia, *Geoarchaeology* 22, 1, 2007, 121–149; W. Vetter, Die Küstenverschiebungen Kleinasien: eine Konsequenz tektonischer Ursachen, in: *Lebendige Altertumswissenschaft. Festschrift Hermann Vetter* (Vienna 1985) 32–37; D. P. Crouch, *Geology and Settlement. Greco-Roman Patterns* (Oxford 2004) 215–241.

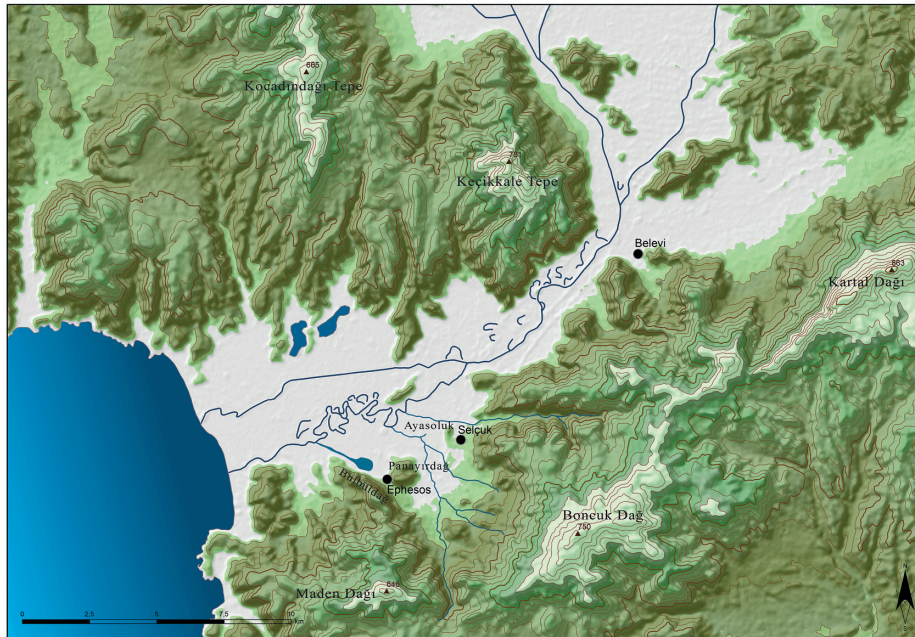


Fig. 5
Modern coastal line of Ephesos
(C. Kurtze
© OEAI)

G. Langmann and H. Zabełlicky in the 1980's⁴. Additional extensive geophysical surveys are complementing these efforts.

Only very little is known about the earliest Ephesian harbors: they are partially mentioned in the ancient sources but their exact location can only be reconstructed through the study of the landscape and paleogeographic drill cores. Fortunately several topographic questions concerning the early settlement history of Ephesos were largely answered in the past years⁵: the early Iron Age settlement of the Greek immigrants can be quite securely localized on the Ayasoluk. By the mid-8th century B.C.E. further settlements gradually developed: at first on the north-west tip of the Panayırdağ which was immediately followed by settlements in the general area of the later Tetragonos Agora. Ephesos' settlement pattern can be easily compared to other sites of the Aegean from the late Geometric-early Archaic period. The growth in population and probably also increased safety encouraged an expansion to new settlements that were closer to travel routes, agricultural fields and fishing areas than the city of the 11th century on the more defensible Ayasoluk-hill. By the 8th century a continual settlement had developed in the general area of the later Hellenistic-Roman city. According to current research there is no evidence for a temporary relocation of the Ephesian people to the area surrounding the Artemision. This has been suggested to have taken place in the 6th century under the Lydian king Croesus⁶.

⁴ Preliminary reports: Stock et al. 2014, 33–66; G. Langmann, Ephesos 1987, *ÖJh* 58, 1988, 8 f.; G. Langmann, Grabungen 1988, *ÖJh* 59, 1989, 8 f.; G. Langmann, Grabungen 1989, *ÖJh* 60, 1990, 31; Zabełlicky 1995, 201–215 with references to the older excavations at the end of the 19th and beginning of the 20th cent.; Zabełlicky 1999, 479–484.

⁵ Cf. especially M. Kerschner – I. Kowallek – M. Steskal, Archäologische Forschungen zur Siedlungsgeschichte von Ephesos in geometrischer, archaischer und klassischer Zeit. Grabungsbefunde und Keramikfunde aus dem Bereich von Koressos, *ÖJh Ergh.* 9 (Vienna 2008) with further literature.

⁶ Cf. also M. Mohr, An welcher Stelle lag die archaisch-klassische Siedlung von Ephesos? Neue Überlegungen zur archäologischen und literarischen Evidenz, *ÖJh* 76, 2007, 315: »Aus welchem Grund Kroisos die Siedlung von

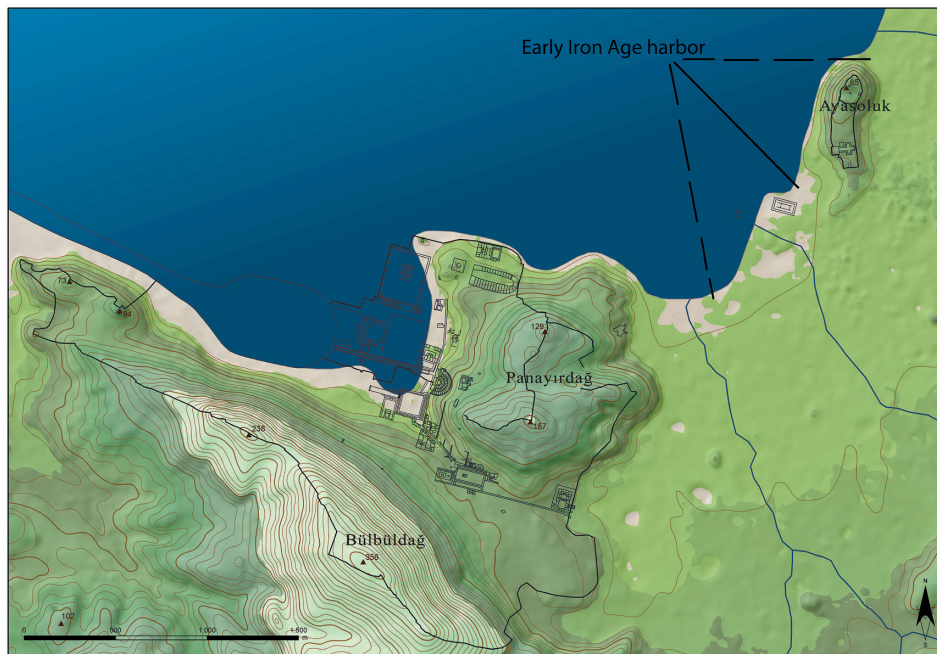


Fig. 6
Possible site
of the early
Iron Age
harbor of
Ephesos
(C. Kurtze –
M. Steskal
© OEAI,
based on
Kraft et al.
2000, 211
fig. 6)

The exact location of the early Iron Age harbor has not yet been identified but it might have served the earliest Greek settlement on the Ayasoluk. Three bays have been suggested for the Iron Age period (**Fig. 6**) but a secure attribution may only be possible through further paleogeographic and geophysical research. Recent studies favor the middle possibility that directly borders the Artemision⁷.

The constant siltation through alluvial deposits of the Cayster, Marnas, Klaseas and Selinus rivers forced a relocation or also multiplication of Ephesian harbors⁸. But what was the cause⁹? From the 16th to 6th century B.C.E. the sea level rose by ca. 120–130 m flooding the Cayster valley up to Belevi, ca. 19 km inland. During the Neolithic period the siltation of the above mentioned rivers pushed the sea back again. At this time however the later lower city of Ephesos was still submerged at about 30 m below sea level. In the 7th and 6th century B.C.E. the center of the bay surrounding the island Syrie – today the

den günstigen Ankerplätzen im Westen und der damit strategisch besten Lage in das verlandende und überschwemmungsgefährdete Mündungsgebiet der umliegenden Flüsse hätte verlegen sollen, wird in der Forschung denn auch nicht weiter angesprochen.«

⁷ An identification of this harbor with the one mentioned by Athen. 8, 62, 361c–e as the ›Sacred Harbor‹ cannot be proven. I am grateful to M. Kerschner for this suggestion. An identification as the ›Sacred Harbor‹ has been traditionally argued by: Kraft et al. 2000, 182–186; D. Knibbe, Ephesos. EFESOS. Geschichte einer bedeutenden antiken Stadt und Portrait einer modernen Großgrabung im 102. Jahr der Wiederkehr des Beginnes österreichischer Forschungen (1895–1997) (Frankfurt 1998) 76 f.; A. Bammer, Zur Topographie und städtebaulichen Entwicklung von Ephesos, *ÖJh* 46, 1961–1963, 142; St. Karwiese, Koressos – ein fast vergessener Stadtteil von Ephesos, in: *Pro Arte Antiqua. Festschrift Hedwig Kenner* 2, *SoSchrÖAI* 18 (Vienna 1985) 217 f.; Merič 1985, 30; indifferent: F. Brein, Zur ephesischen Topographie, *ÖJh* 51, 1976–1977, Beibl. 69 f. with sketch; contra: Scherrer 2007, 347; W. Alzinger, Koressos, in: *Festschrift Fritz Eichler, ÖJh Beih. 1* (Vienna 1967) 5 f.

⁸ Cf. Zabełhicky 1999, 480; St. Karwiese, Groß ist die Artemis von Ephesos. Die Geschichte einer der großen Städte der Antike (Vienna 1995) 19. 22. Concerning the uncertain identification of the various streams with the toponyms Klaseas, Selinus and Marnas cf. Scherrer 2007, 348.

⁹ Kraft et al. 2000, 177 f.; Kraft – Kayan – Brückner op. cit. (n. 3: 2005) 147–156; Scherrer 2007, 323; P. Scherrer, The Historical Topography of Ephesos, in: D. Parrish (ed.), *Urbanism in Western Asia Minor. New Studies on Aphrodisias, Ephesos, Hierapolis, Pergamon, Perge and Xanthos, JRA Suppl. 45* (Portsmouth 2001) 58.

Korudağ hill – reached a depth of ca. 15 m. Around 400 B.C.E. the level had dropped to 12 m. By the mid-1st century B.C.E. the area of the bay to the island Syrie had completely silted up¹⁰. Early on the massive alluvial deposits impeded the navigability of the harbor by the Artemision. An older study¹¹ suggested that the harbor by the Artemision – if we really want to localize it there – could be reached by boat until the 2nd century B.C.E. New drill cores in the area dismiss this theory: the bay by the Artemision completely silted shut by the 4th century B.C.E.¹².

As already mentioned the second harbor of Ephesos was the so-called Koressos-harbor. This harbor has been localized in a bay close to the Roman stadium due to literary evidence¹³ (Figs. 7. 8). It appears that the construction of this harbor took place simultaneously with the development of new parts of the city around the Panayırdağ in the mid-8th century. But archaeological evidence for this theory is still lacking. The use of this harbor is attested until the 5th century: the Athenian fleet under the command of Thrasyllus attacked and landed in the Koressos-harbor in 409 B.C.E.¹⁴. The Koressos-harbor does not appear in any literary sources after the 4th century¹⁵. Recent palaeogeographic studies show that the bay silted shut by the 1st century B.C.E.

The progradation of the Cayster delta-floodplain led to rising water levels and siltation in the area to the north and north-east of the Panayırdağ. The resettlement of the city under Lysimachos partially eased the danger to the settlement in around 300 B.C.E.¹⁶: he designed a new city with an orthogonal grid and designated particular areas as living quarters, public and commercial spaces in the Upper City, on the northern slopes of the Bülbüdağ and the western slope of the Panayırdağ¹⁷. The bay along the western

¹⁰ Cf. Scherrer 2007, 345 f. based on H. Brückner, *Geoarchäologische Forschungen in der Westtürkei – das Beispiel Ephesos*, in: T. Breuer (ed.), *Geographische Forschungen im Mittelmeerraum und in der Neuen Welt*, Passauer Schriften zur Geographie 15 (Passau 1997) 42–44.

¹¹ With more detail: Kraft et al. 2000, 187.

¹² Cf. Stock et al. 2014, 33–66; F. Stock, *Paläogeographische und geoarchäologische Studie zum holozänen Küstenwandel im Umfeld der antiken Stadt Ephesos, Westtürkei* (Diss. University of Marburg 2010) 124–126.

¹³ Cf. Scherrer 2007, 327 f. With references: Athen. 8, 62, 361c–e; Paus. 7, 2, 6; 5, 24, 7; Strab. 14, 1, 2, 21; also: Knibbe, *op. cit.* (n. 7) 76 f.; J. Keil, *Zur Topographie und Geschichte von Ephesos*, *ÖJh* 21/22, 1922–1924, 104; P. Scherrer, *Bemerkungen zur Siedlungsgeschichte von Ephesos vor Lysimachos*, in: Friesinger – Krinzinger 1999, 383; P. Scherrer – E. Trinkl, *Ephesos in klassischer Zeit: Zusammenfassung des Forschungsstandes*, in: P. Scherrer – E. Trinkl, *Die Tetragonos Agora in Ephesos. Grabungsergebnisse von archaischer bis in byzantinische Zeit – ein Überblick. Befunde und Funde klassischer Zeit*, *FiE* 13, 2 (Vienna 2006) 263 f.; Scherrer, *op. cit.* (n. 9) fig. 3–1; M. Kerschner – M. Lawall – P. Scherrer, *Ephesos in archaischer und klassischer Zeit. Die Ausgrabungen in der Siedlung Smyrna*, in: F. Krinzinger (ed.), *Die Ägäis und das westliche Mittelmeer. Beziehungen und Wechselwirkungen 8. bis 5. Jh. v. Chr. Akten des Symposions Wien 24. bis 27. März 1999*, *Archäologische Forschungen 4 = DenkschrWien* 288 (Vienna 2000) fig. 15; H. Engelmann, *Der Koressos, ein ephesisches Stadtviertel*, *ZPE* 115, 1997, 131–135; Meriç 1985, 30; cf. also H. Engelmann, *Beiträge zur ephesischen Topographie*, *ZPE* 89, 1991, 286–291 and the immediate response by D. Knibbe, *Topographica Ephesiaca. Damnianosstoa, Androklosgrab – Olympieion und Koressos*, *ÖJh* 71, 2002, 213–219.

¹⁴ Xen. *hell.* 1, 2, 1–10; Diod. 13, 64, 1; L. Koenen, *A New Fragment of the Oxyrhynchite Historian*, *StP* 15, 1976, 39–79 especially 55 f. 69 f. (edited Papyrusfragment P. Cairo Temp.Inv.-Nr. 26/6/27/1–35); cf. also G. A. Lehmann, *Ein neues Fragment der Hell. Oxy.: Einige Bemerkungen zu P. Cairo (Temp. Inv.) 26/6/27/1–35*, *ZPE* 26, 1977, 181–191; H. Wankel, *Sprachliche Bemerkungen zu dem neuen Fragment der Hellenica Oxyrhynchia*, *ZPE* 29, 1978, 54–56.

¹⁵ Cf. Scherrer 2007, 347.

¹⁶ Cf. Scherrer 2007, 344 f.

¹⁷ Cf. Groh 2006, 54–72.

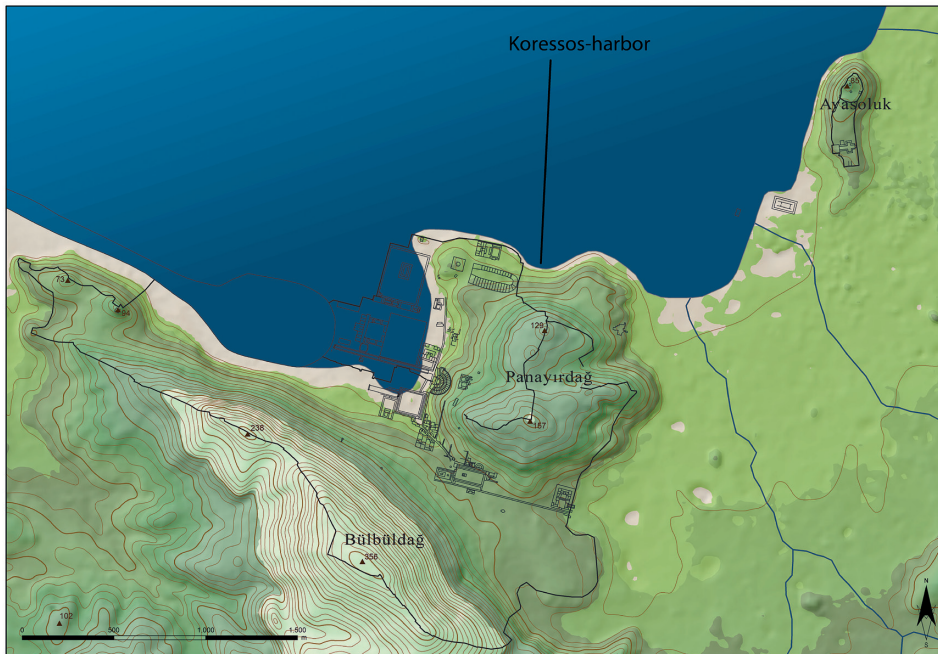


Fig. 7
Location of
the Koressos-
harbor
(C. Kurtze –
M. Steskal
© OEAI,
based on
Kraft et al.
2000, 211
fig. 6)



Fig. 8 The Koressos-harbor by the Panayırdağ from the east (N. Gail © OEAI)

slope of the Panayırdağ became the main harbor¹⁸ (Figs. 9. 10), when this bay still represented the maximal marine transgression and was mostly filled with seawater. It was unknown until recently if sturdy constructions as for example piers or quays existed. New

¹⁸ Kraft et al. 2000, 188 f.

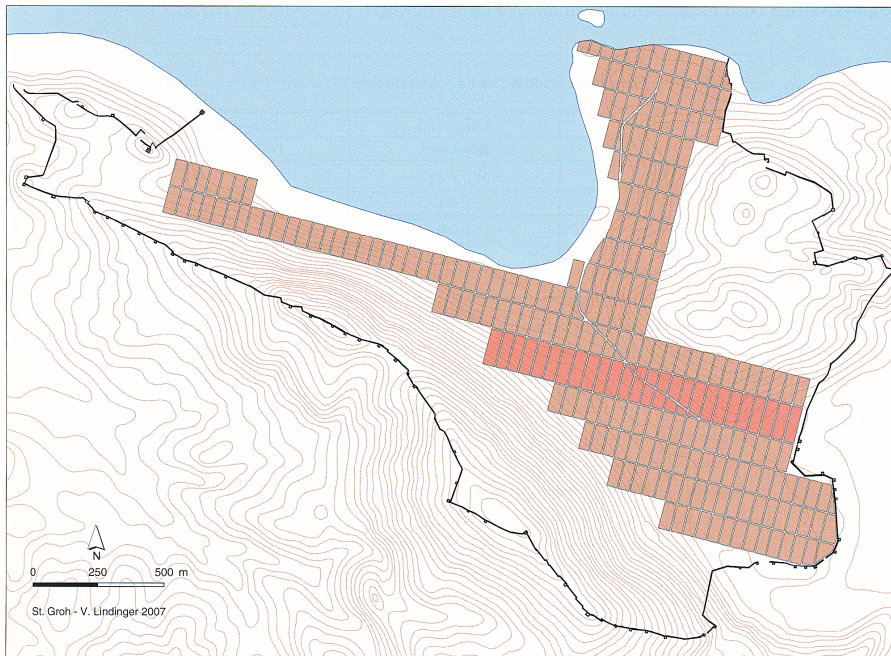


Fig. 9
Hellenistic
settlement
of Ephesos
(Groh 2006,
fig. 5)

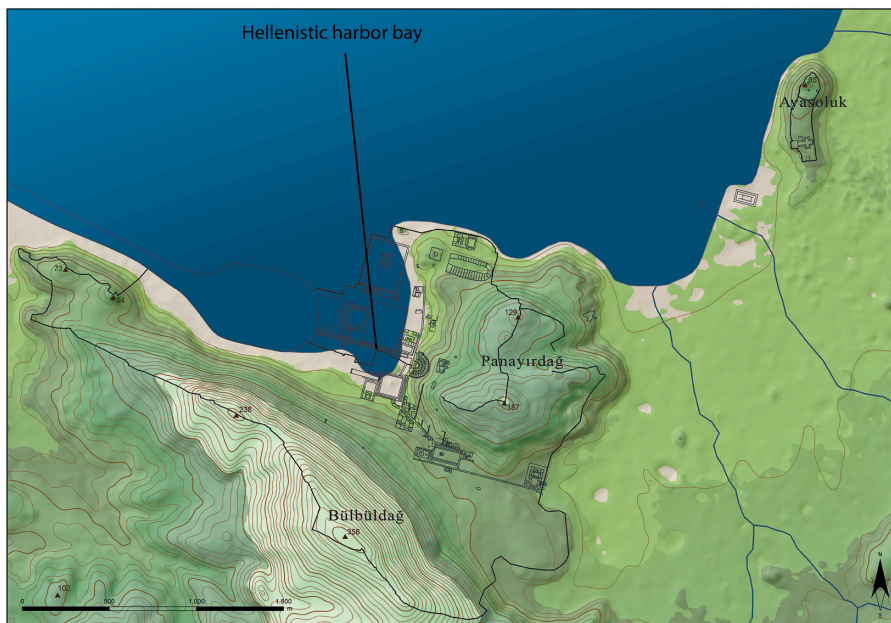


Fig. 10
Location of
the Hellenistic
harbor bay
(maximal
marine
transgression)
(C. Kurtze –
M. Steskal
© OEAI, based
on Kraft et al.
2000, 211 fig. 6)

paleogeographic studies though provided evidence for a 3rd century B.C.E. channel which hollowed out of the marine sediments and lead into a harbor basin or bay¹⁹. The channel corresponds with the later Roman harbor channel that was expanded to the north by a couple of meters at the end of the 1st and beginning of the 2nd century C. E. By the time of Attalos II Philadelphos (159–138 B.C.E.) the Hellenistic harbor was furnished with buildings and a dam that was supposed to eliminate the siltation from the Cayster as Strabo

¹⁹ R. Urz kindly provided this reference.

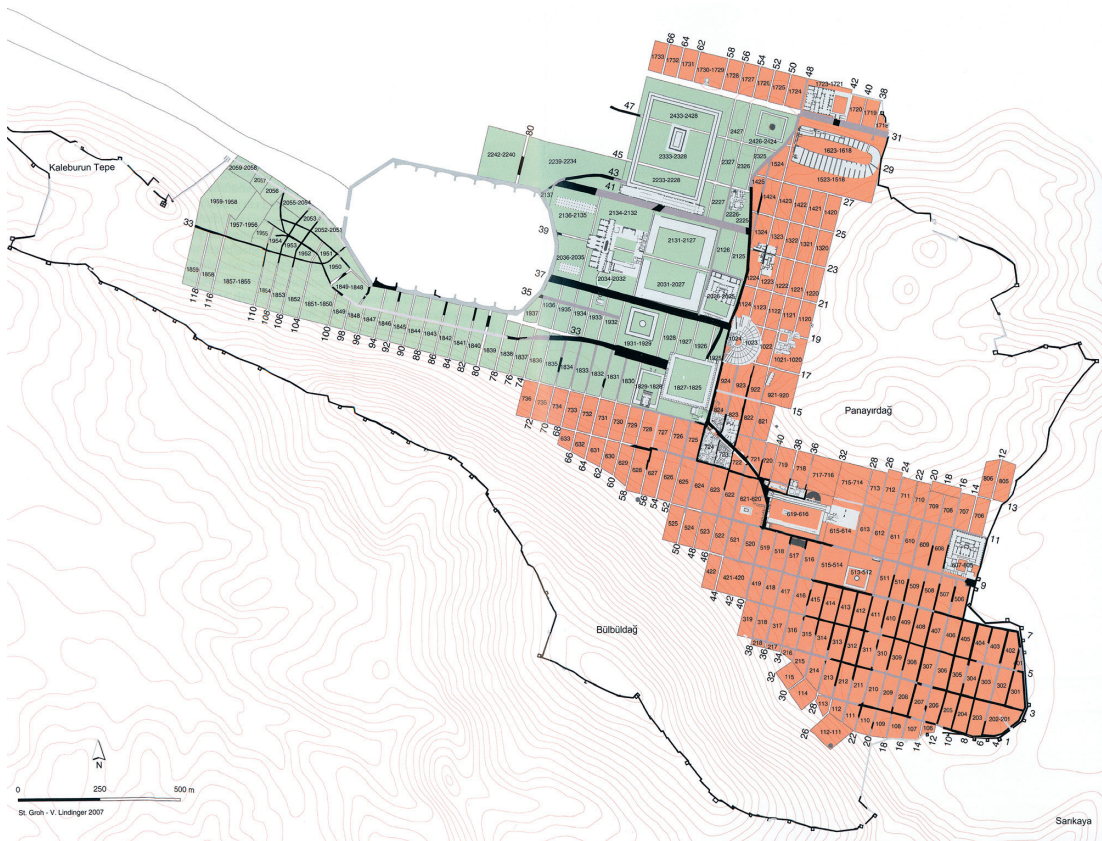


Fig. 11 Imperial settlement of Ephesus (Groh 2006, fig. 20)

reports²⁰. This was necessary, Livy describes, since already in 190 B.C.E. the channel was only wide enough to fit one ship²¹. The project of the Pergamene king Attalos though had the opposite effect since the silt of the river could no longer be removed through the ebb and flow of the sea.

In the course of the 1st and early 2nd century C. E. the bay was artificially filled up and terraced due to the continual siltation of the bay²². The newly acquired land was used for large scale building projects, e. g. the Harbor Baths and the Olympieion, allowing for a further expansion to the west. This though required a new harbor.

Aerial photographs, old maps, excavations in the west, the known location of the harbor gates in the east, geophysical prospections and GPS-surveys have led to the reconstruction of a long hexagonal harbor²³ (Figs. 11. 12). A building in connection with the harbor sits atop the Çanakgöl Tepe. The foundations of this structure – it has only been

²⁰ Strab. 14, 1, 24; cf. Zabehlicky 1999, 481. O. Benndorf, *Zur Ortskunde und Stadtgeschichte, FiE 1* (Vienna 1906) 18–22. 46–50 and 58 f. combines these events as well as the expedition of Thrasyllos with the later Roman harbor.

²¹ Liv. 37, 14 f.; cf. Scherrer 2007, 349.

²² Scherrer 2007, 335–337; Groh 2006, 72 f.

²³ Cf. Zabehlicky 1995, 201–215; Zabehlicky 1999, 479–484; Groh 2006, 97–100. This map is particularly helpful: E. Falkener, *Ephesus and the Temple of Diana* (London 1862) pl. 2.



Fig. 12
Coastal line of
Ephesos from the
Imperial period
with Roman
harbor basin and
harbor channel
(C. Kurtze –
M. Steskal
© OEAI, based
on Kraft et al.
2000, 229 fig. 15)



Fig. 13 Roman building on the Çanakgöl Tepe in Ephesos (M. Steskal © OEAI)

studied sporadically – are made of roughly dressed blocks of local limestone and slate (**Fig. 13**). The harbor was connected to the sea through a long channel. In the 1980's the quay walls and the pier furthest to the south-west were studied through excavations in an area to the south-west of the harbor (**Fig. 14**). Large stone blocks facing the harbor basin line the 2 m wide quay wall, the 4 m wide jetty projects into the harbor basin by about 9 m. The concave curvature of the quay wall leads ca. 58 m to the east where it juts into another jetty. A third jetty was mapped out further east allowing for a reconstruction of 8 piers on both the south and north side of the harbor basin²⁴. The depth of the basin was determined in the area around the jetties through dives which was estimated

²⁴ Cf. Groh 2006, 99 f.



Fig. 14 Quay walls of the Imperial harbor of Ephesus in the area of the jetty to the south-west (J. Reiter © OEAI)

at 4 m under the ancient water level; the harbor basin itself would have been slightly deeper²⁵. The size of the harbor basin was ca. 390 × 650 m and covered 21 ha. The exit to the channel in the west was only 23 m wide – if the old maps can be trusted; the channel itself was 60 m wide. The excavations and epigraphic sources suggest that the harbor construction took place under Trajan or Hadrian²⁶. The contemporary harbor of Rome in Portus had a similarly hexagonal harbor basin. In comparison, the Ephesian harbor was one third smaller than the harbor in Portus²⁷. The harbor exit in Portus measures 100 m and was therefore more spacious than in Ephesus. The minimal depth and the narrow channel arouse suspicion if the harbor and passageway were intended for large cargo ships with deep draughts. Moorings along the coast support this suspicion. The moorings were constructed in the late 2nd century by Titus Flavius Damianus and probably were used for the reloading of cargo onto smaller ships²⁸. Moreover Strabo describes outer harbors for Ephesus, e. g. the Panormos-harbor²⁹.

²⁵ Zabełhlicky 1999, 480; Zabełhlicky 1995, 209.

²⁶ Cf. Zabełhlicky 1999, 481; Scherrer 2007, 349; IvE 2061 (Flavius Montanus). 3066 (C. Licinius Maximus Iulianus) with a report of rich foundations for the amenities of the harbor; IvE 274 with an honor for the emperor Hadrian for making the Cayster navigable and the constructing a dam. In the mid-2nd c. parts of the quay had to be protected due to the storage of wood and dressing of stones (IvE 23). A compilation of the sources can be found in: Zabełhlicky 1995, 204–206.

²⁷ Groh 2006, 99 f.; S. Keay – M. Millett – L. Paroli – K. Strutt, *Portus. An Archaeological Survey of the Port of Imperial Rome*, Archaeological Monographs of the British School at Rome 15 (London 2005); Zabełhlicky 1999, 481; Zabełhlicky 1995, 210 f.

²⁸ Philostr. *soph.* 2, 23.

²⁹ Strab. 14, 1, 20.

We know only very little about the constructions in the area around the harbor. Presumably magazines and warehouses, stockyards and markets as well as ship houses and ship yards filled the space but these have not yet been discovered. The foundations of two buildings with three naves were found to the east of the harbor basin. The structures are 25 m wide with a length of 60 as well as 120 m. They are currently interpreted as open porticos that were used for the trade and sale of items³⁰. A densely populated workshop quarter has been localized within the city limits along the harbor channel. The development of a far-flung necropolis outside of the city gates began in the Middle Imperial period to both sides of the harbor channel. The harbor channel received the additional meaning of a burial procession or ›Gräberstraße‹.

Another monumental building project surrounding the harbor took place at the end of the 2nd or early 3rd century C. E. when a southern and northern harbor gate was erected³¹. In this period or a little later, special endowments were made available for the harbor³². The fight against silting in the harbor began in the early construction phase. This resulted in the continual dredging of the harbor and the permanent lengthening of the channel by 1.2 km³³. Through the integration of the channel into the Cayster River the now 4 km long channel ended only a few hundred meters east of the modern beach at Pamucak³⁴.

The Roman harbor was used for a long time despite its many problems: in 431 C. E. Cyril, the patriarch of Alexandria arrived in the Roman harbor on his visit to the council. He had to transfer into a smaller boat in an outer harbor; in 723 Saint Willibald arrived in the Roman harbor³⁵. Later medieval pilgrims sadly did not report precise locations detailing which harbor they used on their travels through Ephesos on their way to the Holy Land. Recent paleogeographic data³⁶ suggests that the channel lost all access to the sea by about the 7th century C. E.; it silted shut and was covered by turf. Literary sources suggest that parts of the Roman harbor may have still been accessible in the 12th century. The sources mention a Russian abbot Daniel who ventured on a pilgrimage in 1106³⁷. This may be explained by the fact that heavy rains occasionally filled the channel with enough water

³⁰ H. Thür, *Marktbauten am Hafen*, in: P. Scherrer (ed.), *Ephesos. Der neue Führer. 100 Jahre österreichische Ausgrabungen 1895–1995* (Vienna 1995) 180 f.

³¹ W. Wilberg – G. Niemann, *Der südliche Torbau*, in: *FiE 3* (Wien 1923) 172–188 as well as W. Wilberg, *Der nördliche Torbau*, in: *FiE 3* (Vienna 1923) 214–217. The middle gate was possibly already built in the Hadrianic period, cf. W. Wilberg – G. Niemann, *Der mittlere Torbau*, in: *FiE 3* (Vienna 1923) 189–213 also Zabeňlicky 1999, 481 with reference to H. Thür und P. Scherrer; Zabeňlicky 1995, 203. For the integration of the harbor gates into the city planning: Groh 2006, 98. I am grateful to G. A. Plattner for confirming the suggested datings.

³² D. Knibbe – B. İplikçiođlu, *Neue Inschriften aus Ephesos IX*, *ÖJh* 55, 1984, 130 f. (honor for Valerius Festus).

³³ Kraft et al. 2000, 191.

³⁴ Cf. Scherrer 2007, 349.

³⁵ Scherrer 2007, 349; H. Engelmann, *Der ephesische Hafen in einer koptischen Erzählung*, *ZPE* 112, 1996, 112.

³⁶ Reference from R. Urz.

³⁷ The areas excavated in the 1980's on the southern edge of the harbor are too small to fully agree with the suggestions of the excavator. According to him the area surrounding the Roman harbor was only used intensively until around 600 C.E. Cf. Zabeňlicky 1999, 482; Zabeňlicky 1995, 211; H. Zabeňlicky, *Ein spätantiker Bau im südlichen Hafenbereich von Ephesos* (Vorbericht), in: H. Malay (ed.), *Erol Atalay Memorial, ADerg* 1, 1991, 197–205; similarly Scherrer 2007, 349.

for the passage of boats into the harbor basin. Even today the channel still partially fills up with water.

Further medieval harbors will only be briefly mentioned in the following³⁸: the harbor at Pamucak was in use up until the 16th century, or also a harbor by the village Kuştur slightly north of Kuşadası. The outer harbor Panormos was mentioned earlier. According to R. Meriç the Panormos-harbor was used up until the 14th century as the harbor of the Aydınogulları-dynasty³⁹. The actual site is not known: it has been speculated to be north of the Cayster in the so-called Alaman Gölü⁴⁰, in the valley of Arvalya⁴¹ and the south end of the bay of Pamucak⁴². From a geoarchaeological standpoint the latter option appears to be the most plausible⁴³.

After the 16th century Ottoman Ephesos – now known under the name Ayasoluk – does not appear to have had any harbor. The town lost much of its significance until the 20th century when it was revived by bands of archaeologists and masses of tourists. The result of living separated from the sea by a distance of 8 km has impacted modern day Selçuk: it is impossible to economically compete with other coastal towns as for example Kuşadası.

The importance of the harbors for the growth but also decline of the city emphasizes a need for further systematic research of the Ephesian harbors. The nature of the terrain and the ensuing technical challenges has been the main impediments to the study of the harbors. Current geoarchaeological and geophysical research has led to numerous new ideas that could function as the basis or groundwork for larger scale future field-archaeological activities. A navigable entrance into the city from the sea and a functioning infrastructure were key elements for the growth and prosperity of Ephesos as a commercial center. Understanding the harbor will considerably illuminate the fate of the city.

³⁸ Cf. Kraft et al. 2000, 191 f.

³⁹ Meriç 1985, 30–32.

⁴⁰ Meriç 1985, 30–32. This theory is viewed as plausible by Kraft et al. 2000, 191 f. 200.

⁴¹ J. Keil, *Ortygia*, die Geburtsstätte der ephesischen Artemis, *ÖJh* 21/22, 1922–1924, 113–119; C. Foss, *Ephesos after Antiquity: A Late Antique, Byzantine, and Turkish City* (Cambridge 1979) 149; G. Hess, *Die Entwicklung des Küçük-Menderes-Deltas in historischer Zeit*, *Essener Geographische Arbeiten* 17, 1989, 1–12.

⁴² Scherrer 2007, 349.

⁴³ Thanks go to H. Brückner for this reference.