



## **Evidence for intensive flow from the Bosphorus northwards during the early Holocene**

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A geological and geophysical marine survey was carried out along the distal continental shelf off the northern edge of the Bosphorus Strait in the southern Black Sea in summer 2005. The survey comprised high-resolution chirp profiling and gravity coring along the distal continental shelf at water depths of approximately 100 m. The chirp survey confirmed previous observations of two extensive depositional unconformities at the top of the sedimentary sequence. The survey also delineated a series of exposed and subsurface morphological features that were attributed to subaerial erosion. The strata below the lower unconformity seem truncated by erosion and carry freshwater shells and preliminary dating shows that their age is older than 40,000 years. The layers above the upper unconformity carry marine shells, their bedding uniformly cover pre-existing features and their dating yielded age of 4,400 years. The layer between the two unconformities shows disrupted bedding, most of the shells embedded in it are marine, but occasionally fresh water shells were discerned. The evidence of extensive subaerial erosion is compatible with the reported evidence of a huge delta that extends from the northern edge of the Bosphorus northwards across the shelf and the upper slope.

Conflicting interpretations of geological, geochemical and geophysical studies regarding the variable water composition of the Black Sea and its changing water level during the early Holocene were presented during the last 12 years in the scientific literature.

While it is generally agreed that a fresh-brackish water lake existed in this basin after the Last Glacial Maximum, when global sealevel was approximately 125 m lower than its present level, there is disagreement on the rate in which the Black Sea changed into its present marine environment. Our data is in agreement with previous findings suggesting that abrupt marine flooding took place in the Euxenic Lake, the fresh water predecessor of the Black Sea. We verified the occurrence of a large and elaborate delta north of the Bosphorus Straits, which was formed by a flow that was by far stronger than the present flow. Our data suggest further that the distal continental shelf of the southern Black Sea had been subaerially eroded by rivers that had incised channels and accreted levees, that were partly eroded later by the subsequent flood. Thus we suggest that the strong erosion of the lower unconformity occurred as a result of a drastic drop of the Euxenic Lake level. The upper unconformity probably reflects the last phase of the lacustrine deposition, which was terminated by the abrupt invasion of the Mediterranean waters. The thin veneer of post-flood deposition can be attributed to the present Black Sea sedimentology.