

Pleistocene to Holocene palaeoenvironmental changes in the NW Black Sea: from isolation to connection

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Abstract: *This study investigates the palaeoenvironmental modifications mirrored in the depositional regime of the NW Black Sea region during Pleistocene (since LGM – Last Glacial Maximum) up to the Holocene. The Black Sea, the largest anoxic basin in the world, became a giant freshwater lake during the LGM. According to many authors, it drew down to levels exceeding 100 m below its nowadays outlet. During the Early Holocene, an outstanding event took place, the reconnection with Mediterranean, which marked the end of the lacustrine phase and the onset of the marine anoxic regime, similar to the present-day deeper parts of the Black Sea. For investigating these modifications, we have acquired and studied several sediment cores up to 4 m long from the NW Black Sea at various water-depths; the absolute age of the cored interval extends from around 22000 yr BP, within the LGM time-lapse, up to 2500 yr BP (upper Holocene). In most cores the three lithological units characterizing the Black Sea, such as (oldest first): Unit 3 (Lacustrine Lutite), Unit 2 (Sapropel Mud) and Unit 1 (Coccolith Mud), were observed; in a shallower setting, i.e., above 172 m water depth, the last two units are absent. The deeper cores contain within Unit 3, besides greenish silty clays, a red-brown depositional interval, with a variable lithology, including clays, marls, and fining-up Bouma sequences, interpreted as turbidites. In the cores placed below 600 m water depth, two distinct red-brown intervals are present, interpreted either as distinct episodes of massive meltwater discharge brought from the Eurasian Ice Sheet, either reflecting erosion and redeposition in the basin. Investigations of total organic carbon and organic matter contents, along with stable isotopes $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ and various elements (Mg, N, K, Cr, V, Ti, Cr, Sb, Sr, S, Zn, Cu and Ni), indicate significant modifications from the Upper Pleistocene to the Holocene in the Black Sea basin.*

Key words: Last Glacial Maximum, Holocene, NW Black Sea, sedimentology, geochemistry.