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Black Sea north-western shelf hypoxia: a study based on diagenetic processes and sedimentary proxies

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In some coastal systems, bottom waters are depleted in oxygen which is a natural-recurring phenomenon. This especially occurs in basins with limited water circulation and on shelves exposed to considerable nutrient upwelling. In addition to this natural hypoxia, anthropogenic activities such as increased riverine nutrient inputs may affect the frequency, extent and duration of hypoxia. This occurrence has several impacts on the coastal zone including the benthic compartment, in particular when free sulfides are liberated from sediments and accumulated in the bottom waters.
Within the framework of the BENTHOX project, a biogeochemical study in the Black Sea has been undertaken. It aims at investigating the diagenetic pathways influenced by hypoxia and at identifying proxies for the reconstruction of hypoxia history. On board the R/V Mare Nigrum, during EMBLAS-II cruise in August 2017, sediment cores were collected on the Ukrainian shelf. Porewaters were extracted using the Rhizon technique and will be analysed for nutrients, major anions (chloride, sulfate/sulfide) and redox sensitive metals (iron, manganese). Major solid phases and particulate trace element contents will also be determined to better understand the impact of hypoxia on diagenetic processes.
Results obtained for the summer 2017 cruise will be presented and compared with those acquired for the spring 2016 cruise, in terms of diagenetic reactions identified. Moreover, data of core scanner XRF analysis as well as δ13C and δ15N for the sediment cores collected in 2016 will be shown. These results will be discussed in order to identify proxies of hypoxic events during the Holocene period.