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Recent environmental change in a marine protected area as reflected by sediment proxy data.

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The Koster Trench is the deepest part of the Kosterfjord (Skagerrak, North Sea), which stretches southward along the west coast of Sweden. Since 2009 Kosterfjord has been included in the Marine Protected Area Kosterhavet National Park due to the presence of cold-water coral reefs. In this study we present multiproxy data from the sediment core KSK12-01D taken in the southern part of the Koster Trench. The core has been dated by ¹³⁷Cs and was subject to bulk geochemistry (TOC, C/N and heavy metals: Ni, Cu, Zn, As, Cd and Pb) and micropaleontological (benthic foraminifera, dinocysts and selected palynomorphs) analyses. Results show that the core is an archive for the environmental changes that took place between ~1988 and 2012. Both TOC and heavy metals indicate high/good to moderate ecological quality status, as defined by the Swedish Environmental Protection Agency. Dinocysts suggest a major change occurring in the upper water column around 2002. The cysts of *Pentapharsodinium dalei* peak around 1992 and shows overall slightly higher relative abundances between 1988 and 2002. Increased abundance of cysts produced by *Protoceratium reticulatum* (i.e. *Operculodinium centrocarpum* sensu Wall and Dale 1966), cysts produced by *Biecheleria baltica* and heterotrophic dinoflagellates, oligotrichids, pollen and spores characterise the upper core part deposited from 2002 to 2012. Furthermore, there is a clear increase of calcareous *Alexandrium* cysts in the top of the core (~2008-2012). Benthic foraminifera show a major faunal change reflected in a drastic increase of agglutinated species (mainly *Textularia earlandi*) from 2007 towards present day, while the lower part of the core (1988-2007) is dominated by calcareous species (*Stainforthia fusiformis*, *Epistominella exigua*, *Cassidulina laevigata*, *Bulimina marginata* and *Hyalinea balthica*). Overall, the changes in the dataset suggest an increased freshwater input or a higher river/land runoff, as supported by a local climate and hydrography data showing increasing precipitation and particulate organic carbon in the surface waters over the time period covered by our record.