Multi-proxies and benthic foraminifera approach as indicator of past eutrophication events from the west French coast.

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Abstract

In the last century, present-day coastal ecosystems of the French coast have been ecologically modified during the last 50 years as a consequence of intensive human impacts. Coastal sediments in the absence of disturbance factors (e.g. bioturbation, erosion) are excellent sources of information about past-environments and –communities. Geochemical and biological proxies, including benthic foraminifera paleo-assemblages, were used on two subfossil sediment cores from the Bay of Brest and the Bay of Cherbourg to reconstruct the last 50 years environmental conditions with emphasis on past-eutrophication events. Results were compared with long-term series sea-surface parameters (e.g. chlorophyll a, SST, SSS, nitrate) from French monitoring networks (REPHY, RHLN, RNO). These sites were chosen based on their different pressure levels: low in the Bay of Cherbourg, high in the Bay of Brest. Modern benthic foraminifera and geochemical processes supported paleo-environmental interpretations. Few changes of benthic foraminifera paleo-assemblages and geochemical data (e.g. organic carbon, compound sulfur) were observed from 1980 until today in the Bay of Cherbourg. On the opposite, in the Bay of Brest, a major eutrophication event observed by REPHY in 1993 (± 1 year) was detected in both foraminifera assemblages and geochemical analysis. This study provides recent reconstruction of past-eutrophication event and the associated changes of the environment. It also emphasizes the potential of benthic foraminifera and chemical proxies to reconstruct environmental baseline conditions prior to eutrophication impacts.

Keywords: Eutrophication, multiproxy, paleoecology, indicators

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