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Determination of the best normalizing parameter for heavy metals in sediments of the Belgian Part of the North Sea (BPNS)

In order to determine temporal or spatial changes in heavy metals in sediments, a correction is needed for the grain size effect. Coarse components in sediments, which normally have low levels of heavy metals and organic pollutants, produce a downward shift of the concentration in the total sample. Since sediments of different origin vary in grain size composition, this shift is non-uniform between locations. Therefore, pollutant concentrations should be standardized by using a normalizing parameter for extrapolating the results towards a “standard seafloor”. An important condition for normalizing is that equally polluted samples should show a linear relationship between the concentration of the contaminant and the normalizing parameter. To find the best normalizer, sediments of nine locations of the Belgian Part of the North Sea were taken with a Van Veen grab in March 2015 and sieved into nine different fractions in order to artificially make equally polluted samples. Each fraction was analyzed for heavy metals and possible normalizing parameters (Fe, Al and Total Organic Carbon (TOC)). The best normalizer was determined to be TOC, as this gave the best linear relationship with most heavy metals based on the correlation coefficient. However TOC values are not always available, therefore Fe will be used as second best normalizer for comparing the results of four decades of heavy metal monitoring in the BPNS in the frame of the project “4 decades of Belgian marine monitoring: Uplifting historical data to today’s needs” (4DEMON).

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