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### Introduction

In Belgium, systematic and coordinated marine research initiated in 1970 with Project Sea. The aim of 4DEMON is to inventory, integrate, intercalibrate and analyse data on contamination, eutrophication and acidification obtained over the last 4 decades in the Belgian Continental Shelf. Within the project, contamination focuses on heavy metal and PCB concentrations in biota and sediment. Problems encountered are:

- High variety in available data and metadata, scattered over different data sources (Table 1).
- Changes in the applied methodology and influence of these changes on the data.
- Availability of diverse pollutant concentrations on different sediment grain size fractions.

### Method reconstruction

- In a first phase, a complete inventory of available data was performed using the Data Inventory and Tracking System (DITS). Based on information found in the recovered datasets, the applied analysis methods were screened.
- Method reconstruction revealed intra- and interlaboratory method switches. Both major as minor changes are observed, however the influences of these method switches are unclear so far.
- Example of Hg values in *Platichthys flesus* (Figure 1): In the period '78-'98 a Mercury analyser was used, while from '99 onwards an AAS method was applied. A detailed statistical analysis will be performed to infer whether there is a significant change in the Hg values due to this method switch.

### Sediment normalisation

In the recovered datasets, it was found that:

- Contaminants are analysed on different sediment fractions: <63µm, <500µm, <2mm, total sample.
- Possible available normalisers differ per dataset: Al, Fe, OC, grain size distribution or absent.

Additional measurements are needed to:

- Evaluate the suitability of the normalisers and derive a pivot value for these normalisers.
- Conversion of the recovered datasets to allow comparison of the available data and to establish time series spanning several decades.

These measurements are carefully planned:

- Sampling locations are defined based on local mineralogy and average grain size distribution (Figure 2).
- Sieving procedures are adjusted from Smedes & Nummerdor (2003).
- Heavy metals, PCBs, Al, Fe, Li, TOC, LOI, CaCO<sub>3</sub> are analysed in 10 subsamples per sample (Figure 3).

Biota	Sediment
PCB – Heavy metal concentration	
Lipid content	TOC
Length/weight distribution	Particle size distribution
Tissue analyzed	Particle size used for analysis
Analytical method	
Quality control data	
Sampling date – Location	

Table 1: Data + metadata needed to be recovered from different data sources.

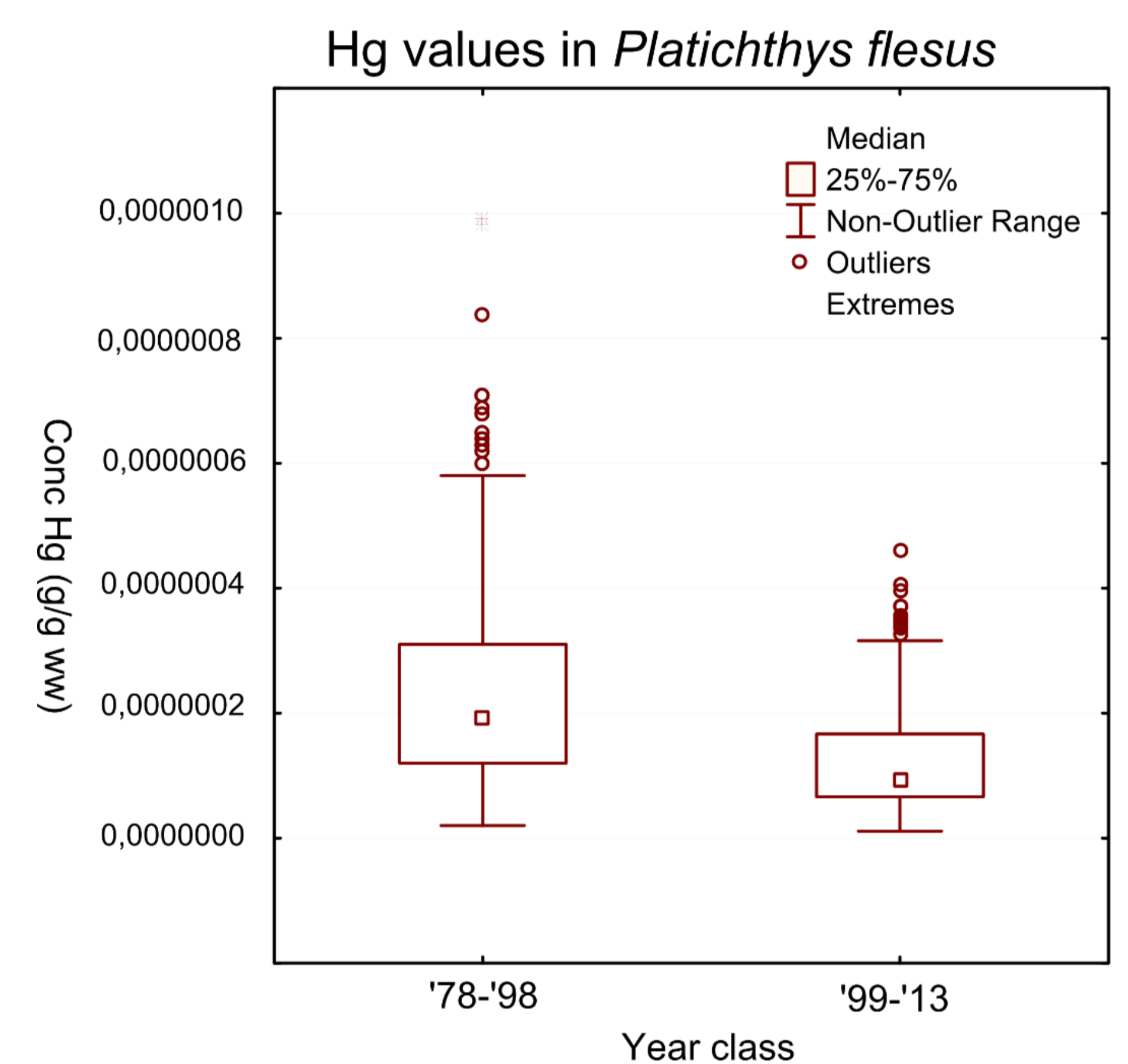


Figure 1: Boxplots of Hg values in *Platichthys flesus* of '78-'98 (Mercury analyser) and '99-'13 (AAS)

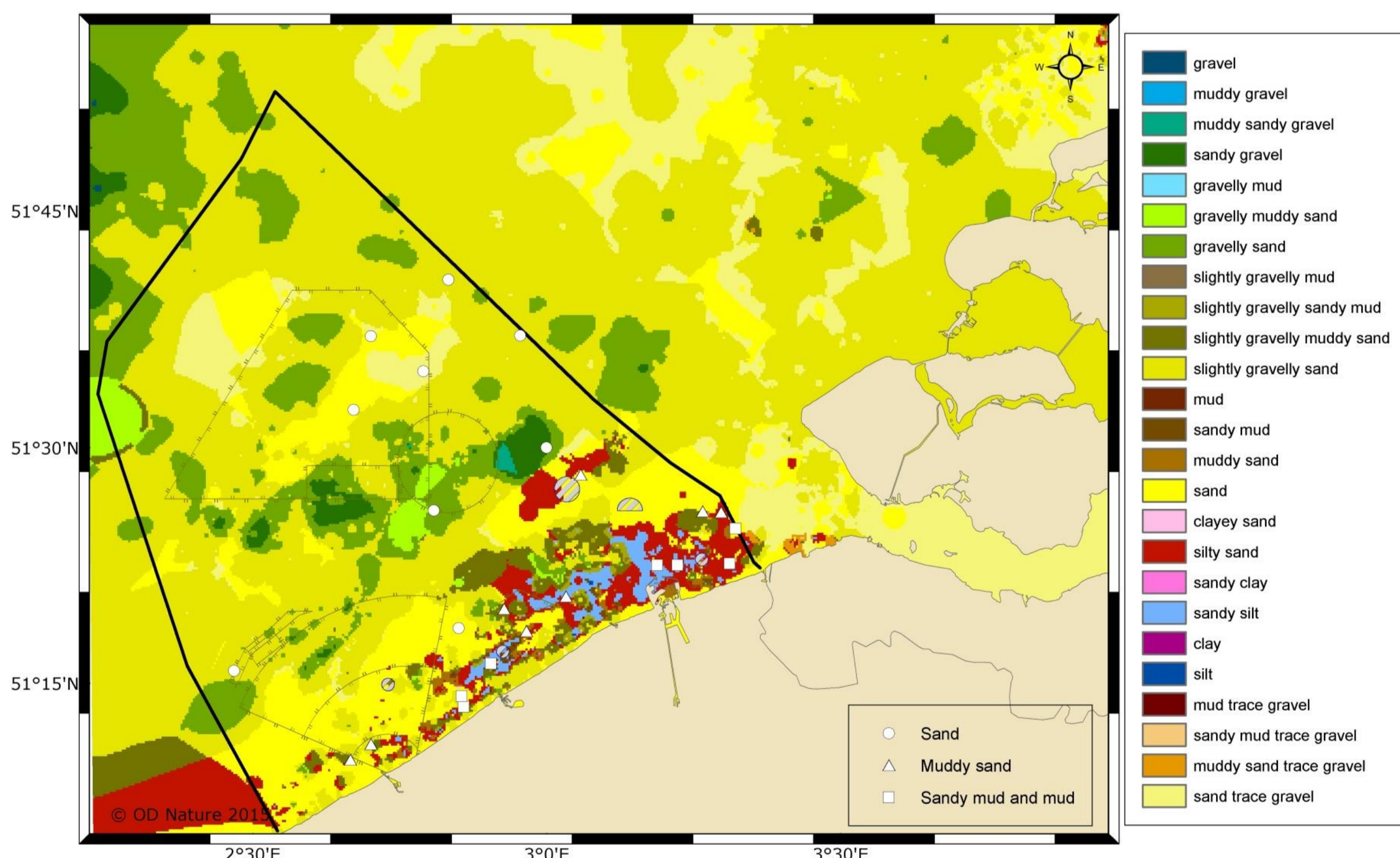


Figure 2: Sampling positions of sediment on the Belgian Continental Shelf (on Folk classification Van Lancker & Van Heteren).

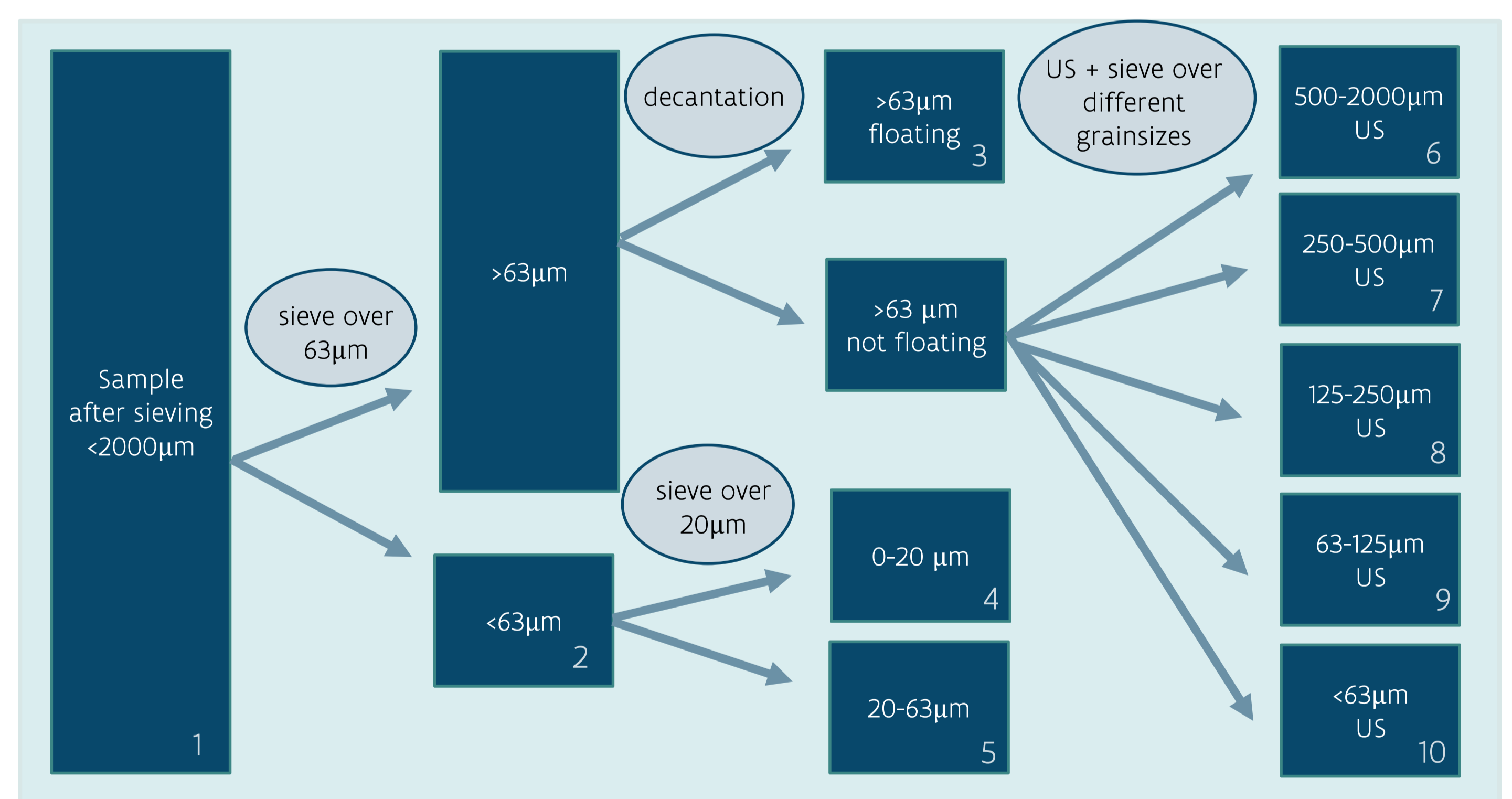


Figure 3: Sieving procedure, with indication of 10 subsamples. US= ultrasonication.

### Further research

- The recovered data will be centralised at the Belgian Marine Data Centre ([www.bmdc.be](http://www.bmdc.be)) and made available via the project's website ([www.4demon.be](http://www.4demon.be)).
- Additional analyses and a statistical approach will be performed to estimate the influence of method switches on the contamination data over the years.
- Normalisers for sediment will be evaluated based on additional analyses. Using these results, data will be converted ('normalised') to allow comparison of the different data sets.
- Time series with normalised data of contamination in biota and sediment will be composed, which will run over several decades. Based on these time series, changes in contamination levels throughout the last 4 decades will be evaluated.