

# The importance of reviewing the Portuguese legislation for the assessment and management of dredged materials: The case of butyltin compounds

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**Introduction:** The maintenance of harbors, ports, marinas, and navigation channels in conditions that allows the development of economic activities implies regular dredging operations. These operations generate significant amounts of contaminated dredged materials and due to that it is required the assessment of the levels of contaminants in the dredged materials to prevent and reduce the release of these hazardous substances in the marine environment.

Like in other countries, Portugal implemented, in 2007, its own legislation to deal with the assessment of contaminants. According to Portuguese environmental legislation, the management of dredged materials is based on a 5-category scheme with increasing trace metal (As, Cd, Cu, Cr, Hg, Ni, Pb, and Zn) and persistent organic pollutant (PAHs, PCBs, and HCH) concentration ranges, from Class 1 (clean dredged material) to Class 5 (heavily contaminated dredged material). In this regulation, butyltin compounds (TBT, DBT, and MBT) are not considered due to the absence of screening levels, which means that in practice they are not frequently monitored.

Based on a set of butyltin compounds data in marine sediment collected in the CSS project, this study intends to demonstrate the importance of modifying the Portuguese Legislation to include these organic compounds and other booster biocides (e.g., irgarol).

**Methods:** A set of thirty-eight surface samples were collected in two oceanographic campaigns carried out in 2019 and 2021 in the SW Portuguese Margin (western Iberian Margin, NE Atlantic). Butyltin compounds were measured in the sediment fraction lower than 2mm, by solid-phase microextraction (SPME)-GC-MS, using NaBEt<sub>4</sub> as a derivatizing agent, based on a previously optimized methodology [1]. Additionally, the fine-fraction and organic carbon contents were also determined.

**Results:** Results indicate in general the presence of TBT in sediments in the vicinity of coastal disposal sites for dredged material, giving proof of the dispersion of contaminated materials after being dumped.

**Discussion:** Therefore, a review of the Portuguese Legislation for the assessment and management of the dredged materials, considering the inclusion of butyltin compounds (and other booster biocides) will be the adequate precautionary approach. Furthermore, it should be established the respective definition of screening levels of contamination based on a weight-of-evidence approach to decision-making on the disposal of dredged material to sea, where are considered the sediment chemistry historical (when available), and new data to be acquired, bioassays, knowledge of both dredging and disposal sites, physical characteristics of the dredged materials and other relevant data. The major benefit of implementing a revision of the legislation is to reduce the contaminants disposal in the marine environment. This will represent a restrictive action to protect the Portuguese marine shelf environment from the effects of TBT (and other contaminants), particularly in the vicinities of dredged material coastal disposal sites.

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**References:** [1] Carvalho et al. (2007) *Microchemical journal*. 87, 147–153.