

Evolution of the monitoring network of seaports to a consideration of European priority substances

Julie Droit¹, Jocelyn Hiliou²

¹CEREMA eau, mer et fleuves. Institute for risks, environment, mobility and development. 155 rue Pierre Bouguer, BP 5, 29280 Plouzané, FRANCE.

Phone: +33-(0)2 98 05 67 32

²Student at the IUEM. European Institute for Marine Studies. Technopôle Brest-Iroise, rue Dumont d'Urville 29280 Plouzané - FRANCE

E-mail: julie.droit@cerema.fr

Introduction: Established in 1997, the REPOM¹ [1] is a network for national monitoring of ports water and sediments quality implemented by the services in charge of the littoral waters control. Since 2010, the water monitoring program has been suspended in favor of a sediment program development. Thus, the monitoring of sediment quality was complemented by the integration of the priority substances of the WFD² and the MSFD³. The REPOM is now part of the MSFD monitoring network for the definition of good ecological status of marine waters under descriptor 8 for contaminants. The analysis of the "transitional phase" data 2010-2015 aims to improve knowledge on concentrations of priority substances in port sediments and to contribute to the evolution of the regulatory framework related to the assessment of the dredged sediments quality.

Methods: 186 ports are monitored by the REPOM in metropolitan France. The concentrations of priority contaminants measured in the sediments of these ports between 2010 and 2015 were analyzed.

Contaminants regulated for dredging activities (heavy metals, tributyltin, PAH, PCB) have been excluded of this study. Threshold values in sediments relative to priority contaminants have been established considering the existing data :

- Quality standard for sediment (Qsed) derived from the Quality standards of the WFD available for the water compartment [2] ;
- Predicted No Effect Concentration (PNEC) based on ecotoxicological data;
- Ecological Assessment Criteria (EAC) established under the OSPAR [3] Convention.

In the absence of information, the concentrations were compared to the analytical quantification limits.

Results: The frequencies of quantification of contaminants and threshold exceedance were determined for the ports of each maritime zone and for the entire metropolitan coastline.

The following table presents the most frequently quantified substances for all the metropolitan ports monitored by the REPOM (excluding regulated contaminants for dredging activities):

Substances	Quantification frequency	Threshold exceedance frequency
Diethylhexylphtalate	79,3 %	2,3 %
Dibutyltin	66,8 %	-
Monobutyltin	60,6 %	-
Dioxins and furans ⁴	60 %	-
Hexabromocyclododecan ⁴	33,3%	0%
Polybromodiphenylether 209 ⁴	31,2%	3,4%
Nonylphenol	25,7 %	24,8 %

Fig. 1 : Most frequently quantified substances of the transitional phase of the REPOM.

Discussion: Review of the REPOM transitional phase allowed to identify a number of recommendations for monitoring of WFD and MSFD priority substances in port sediments :

- Substances that have never been quantified for the entire coastline or for one or more maritime zone may no longer be monitored in the concerned areas : endosulfan sulfate, trifluralin ... ;

- The monitoring of quantified substances on more than 20% of the samples and whose concentrations may exceed threshold values could be strengthened : Diethylhexylphtalate and Nonylphenol for example.

Acknowledgments: thanks to Marion Messenger¹ and Mohamed El Fadili¹ for the management of the REPOM database and their help during the training of Jocelyn Hiliou.

References: [1] Ministry of Environment (2015) *Guidelines for the implementation of the Maritime Ports Monitoring Program*. [2] European Commission (2005). *Common implementation strategy for the water framework directive. Environmental Quality Standards. Substance data Sheet*. [3]Ospar (2012) *General advice. Review of environmental assessment criteria or equivalents*.

1 REseau de surveillance des POrts Maritimes

2 Water Framework Directive

3 Marine Strategy Framework Directive

4 Not quantified in all maritime zones