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New tools for monitoring the chemical status in transitional and coastal waters under the Water Framework Directive

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ABSTRACT

MONITOOL is a European project formed by 16 Partners covering the Atlantic region from the Canary Islands to the Scottish Highlands and Islands. The main driver of this project is to respond to European Directive demands for the assessment of the chemical status of transitional and coastal waters. Diffusive Gradient in Thin Films (DGT), and passive samplers (PS), in general, are already widely used in investigative monitoring and there is an increasing interest in their use for the environmental assessment of water bodies, within European policies requirements. The main barrier hindering the regulatory acceptance of PS for compliance checking is the lack of appropriate Environmental Quality Standards (EQS). EQSs for metals are defined in the dissolved fraction, preventing the use of DGT-labile concentrations for the establishment of the chemical status of water bodies. Thus, the main objective of MONITOOL is to adapt the existing EQSs to DGTs, enabling the use of DGTs for regulatory monitoring. The fulfilment of the overall objective will be achieved by organizing two different campaigns, in winter and summer, which consist in the simultaneous deployment of DGTs and the high-frequency collection of spot water samples. The first sampling campaigns were performed during winter 2018 in 4 selected sites (transitional and coastal sites) in each consortium region (8 regions). All partners followed the same protocol for sampling and analysis to minimize the operational variability. Priority metals (Cd, Ni, Pb) and other specific metals (Al, Ag, Cu, Cr, Co, Fe, Mn, Zn) will be analysed in waters and in the DGT resins. Statistical analysis will be applied to study relations between metal concentrations in DGT and in spot water samples. In a final step, suitable EQS for DGTs will be calculated on basis the statistical relations obtained previously. This will permit a better implementation of the Water Framework Directive in variable systems like transitional and coastal waters.

Keywords: Passive samplers, DGT, Environmental Quality Standards, metals, marine waters.