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Integrated monitoring of nonpolar compounds with the use of Passive Samplers

The subject of the BELSPO financed NEWSTHEPS project is the development of innovative approaches and techniques that address the current fundamental scientific and methodological issues related to the implementation of Good Environmental Status for Descriptor 8 of the Marine Strategy Framework Directive in national and European waters. Specifically novel and integrated passive sampler (PS) based approaches are developed for monitoring nonpolar compounds. These compounds are determined in PS, in this case silicone sheets, Suspended Particulate Matter (SPM) and in sediment obtaining integrated pollution information. Besides chemical monitoring, the interesting link between the chemical concentrations found in SPM and in the sediment and the corresponding grain size distributions is currently investigated. This potentially allows determining the grain size classes that are associated with the highest concentration of nonpolar compounds in the water column and the seabed. To couple the chemical monitoring with sedimentology during a 2-month experiment at sea, sediment traps were used together with a laser scatterometer for measuring the SPM sizes and CTD sensors for estimating SPM concentration and hydrodynamic conditions. Knowledge to be gained is the nonpolar pollutants concentration difference between the PS, SPM and the sediment and how this is chemically explained; and moreover to link the concentration results with grain sizes, mineralogical composition of the sample, the origin of the sediment and also the presence of black carbon. Last but not least, laboratory experiments with PS, SPM and sediment are needed to sometimes simplify and confirm some of the findings derived from the in situ experiments.

Keywords: Passive samplers (PS), Suspended Particulate Matter (SPM)