

## Comparing the Accumulation of PCBs by Passive Samplers and Mussels from the Water Column at a Contaminated Sediment Site

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Passive samplers, including semi-permeable membrane devices (SPMDs), solid phase microextraction (SPME) and polyethylene devices (PEDs), provide innovative tools for measuring hydrophobic organic contaminants (HOCs) originating from contaminated waters and sediments. Because these samplers accumulate only HOCs in the dissolved or bioavailable phase, the samplers can mimic the bioaccumulation of contaminants by some organisms. In this two part comparison, we evaluated the accumulation of polychlorinated biphenyls (PCBs) by water column deployed passive samplers and mussels (*Mytilus edulis*). In the first comparison, PEDs and blue mussels were contrasted. Next, PEDs, SPMDs and SPME were compared. Eighteen PCB congeners were measured in passive samplers and mussels deployed at the U.S. EPA Superfund site in New Bedford Harbor (MA, USA). Passive samplers and mussels were deployed at two stations for approximately 30 days. Comparisons between the three types of passive samplers, and PEDs and mussels were conducted based on the concentrations of PCB accumulated by sampler media (e.g., polyethylene) and mussel lipid. Further, these concentrations were used, along with partitioning coefficients, to calculate dissolved phase concentrations in the water column. In general, mussels bioaccumulated about four times more PCB in their lipids than the PEDs while the three types of passive samplers accumulated relatively similar amounts of HOCs. Calculations of dissolved phase concentrations necessary to result in measured concentrations in lipids and samplers were two to five times greater for the mussels than the PEDs. This research will continue investigating the relationships in HOC accumulation by different types of passive samplers and mussels.