



Seminar announcement

Department of Environmental Engineering

**SUSTAINABLE REMEDIATION OF AQUATIC SEDIMENTS CONTAMINATED WITH
POLYBROMINATED DIPHENYL ETHERS AND HEXABROMOCYCLODODECANE**

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Baysal Batman Seminar Room, Earth Sciences Building Beytepe Campus

The most widely used brominated flame retardants (BFRs), polybrominated diphenyl ethers (PBDEs) and hexabromocyclododecane (HBCDD), are persistent organic pollutants that pose great risk to human health and the environment. We investigated degradation of PBDEs and HBCDD in contaminated aquatic sediments using biotic and abiotic remediation strategies. Sediment microcosms were operated for degradation of BFRs to simulate biostimulation (via addition of carbon and electron source), bioaugmentation (via addition of dechlorinating culture) and natural attenuation (no extraneous substance). Both BDE-209 and gamma-HBCDD microcosms showed the highest degradation rate during biostimulation. BDE-209 bioaugmentation microcosm yielded the greatest extent of debromination, with tri-BDEs detected at the end of incubation. On the other hand, HBCDD natural attenuation and bioaugmentation microcosms showed no statistically significant difference. Abiotic degradation of BFRs was investigated via catalyzed hydrogen peroxide propagations. The most successful application was through fill-and-draw treatments. Finally, all four remediation strategies studied under laboratory conditions were evaluated to develop sustainable remediation principles.