

Jumping out of the frying pan and into the fire? Spatial and temporal trends for PBDE, Dechlorane Plus and alternative flame retardants in samples of the German environmental specimen bank

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In the last century, conventional brominated flame retardants (FR) such as polybrominated diphenyl ethers (PBDEs) were identified as persistent organic pollutants and subsequently regulated. Novel or alternative FRs were introduced as their replacements to meet ongoing market demands. Many of these alternative FRs are also highly chlorinated or brominated and their fate and effects in the environment may be similar to those of their regulated counterparts. Until now there are only few comprehensive data sets about alternative FRs in the environment, particularly for Germany. In order to provide for a systematic overview about the current state of contamination of the German environment to FRs, a large set of terrestrial, freshwater and marine samples from the German environmental specimen bank were analysed for 45 FRs (PBDEs, Dechlorane Plus and brominated aromates, brominated ethers, cyclic BFRs). The substances will be discussed with respect to their spatial occurrence in the environment (including different matrices as well as land use and ecosystem types), their substance patterns and their bioaccumulation potential. Sample series going back to the 1980s, e.g. from coastal herring gull eggs, freshwater fish, tree leaves and roe deer will be used to illustrate time trends for regulated flame retardants and their substitutes. Recommendations will be given to European and international chemical management.