

**RECENT TRENDS OF POLYCHLORINATED BIPHENYLS AND
POLYBROMINATED DIPHENYL ETHERS IN THE HUDSON
RIVER BASIN**

by

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An Abstract of a Thesis Submitted to the Graduate

Faculty of Rensselaer Polytechnic Institute

in Partial Fulfillment of the

Requirements for the degree of

DOCTOR OF PHILOSOPHY

Major Subject: Chemistry

The original of the complete thesis is on file
In the Rensselaer Polytechnic Institute Library

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August, 2007

Spatial and temporal trends were derived for polychlorinated biphenyls (PCBs) and polybrominated diphenyl ethers (PBDEs) throughout the Hudson River basin by analysis of radionuclide-dated cores and surface sediments. This study extends our knowledge of PCBs in the river, and is the first to identify sources and trends of PBDEs.

The Waterford Pool of the upper Hudson River was identified as a reach of significant recent sediment and associated contaminant accumulation. Analysis of contaminant and radionuclide data indicated a gap in the sediment record suggesting major erosion and transport associated with high-flow events of 1976 and 1977. Evidence of anaerobic PCB dechlorination was found including consistent historical trends in the relative abundance of terminal dechlorination congeners. Sediments from the floodplain collected following individual high-flow events between 2002 and 2007 were analyzed for PCBs and total mercury content and provided information on the sources of particles associated with individual events and detailed data related to contaminant transport.

PCB levels in Upper Hudson River sediments deposited between 2002 and 2005 ranged from 0.09 ppm to 11.5 ppm a few miles upstream and downstream respectively of historical inputs from GE capacitor plants. Levels in sediments of the tidal Hudson were on the order of 1 ppm. Analysis of Central Park Lake sediments indicated a decrease in urban atmospheric PCB deposition over the past decade. Samples from Newtown Creek suggested an increasing relative importance of WWTP effluent as a source of PCBs to NY/NJ Harbor sediments.

Recent \sum_A PBDE levels in river basin sediments ranged from 40.3 to 486 ng/g. Sediments influenced by WWTP sources had much higher weight percents of $\sum_{\text{tri-hexa}}$ BDE than Passaic and Upper Hudson River sediments. Dated core profiles showed gradual to dramatic increases in \sum_A PBDE levels from the 1970s to early 2000s, and, in more recent samples, evidence that this trend may be slowing or even reversing. October 2001 sediments in closest proximity to the WTC disaster showed increased levels of \sum_A PBDE, BDE-209, -47, and -99, and BDE-47/BDE-99. Analysis of Central Park Lake sediments indicated that atmospheric deposition is only a minor source of PBDEs to NY/NJ Harbor sediments.