

## SCCWRP Annual Report 2011

### A pilot study of air-water exchange of organochlorine compounds at three coastal estuaries in southern California

*Lisa D. Sabin, Keith Maruya, Wenjian Lao, Dario Diehl, David Tsukada, Keith D. Stolzenbach<sup>1</sup> and Kenneth C. Schiff*

<sup>1</sup>*University of California, Department of Civil and Environmental Engineering, Los Angeles, CA*

#### ABSTRACT

This pilot study investigated the transport of organochlorine compounds (OCs) across the air/ water interface to assess the role of the atmosphere as a source or removal mechanism in three urban estuaries of the Southern California Bight (SCB). Concentrations of chlordane, dichloro-diphenyltrichloroethane (DDT), polychlorinated biphenyl (PCB), chlorpyrifos, and aldrin/dieldrin/endrin were measured in the atmosphere and water column at three water-quality impaired estuarine and/or embayment sites, including Ballona Creek Estuary, the Los Angeles/Long Beach Harbor, and San Diego Bay. Measured concentrations of OCs were used to calculate site-specific gas exchange and dry atmospheric particle deposition fluxes. Net air/water exchange (gas exchange + dry particle deposition) ranged from -27 to 15 ng/m<sup>2</sup>/day (*t*-chlordane), -14 to 20 ng/m<sup>2</sup>/day (*t*-DDT), 38 to 130 ng/m<sup>2</sup>/day (*t*-PCB), -5.0 to 23 ng/m<sup>2</sup>/day (chlorpyrifos), and -0.23 to 75 ng/m<sup>2</sup>/day (aldrin/dieldrin/endrin). Net volatilization out of the water column typically dominated the exchange process. These estimates suggest the atmosphere acts predominantly as a sink for OCs at these sites. This pilot study provides the first estimates of OCs air/water exchange rates reported for these waterbodies, providing insight into the role of the atmosphere in contaminated coastal waterbodies within the Southern California Bight. Additional investigation into the temporal and spatial variability of exchange would be warranted, given the limited sample size of the present study.

#### Full Text

[ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2011AnnualReport/ar11\\_071\\_082.pdf](ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2011AnnualReport/ar11_071_082.pdf)