

Exchange of polycyclic aromatic hydrocarbons between the atmosphere, water, and sediment in southern California coastal embayments

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ABSTRACT

This study investigated cross-media transport between both the sediment and the water column, and the water column and the atmosphere, to understand the role of each compartment as sources or sinks of polycyclic aromatic hydrocarbons (PAH) in southern California coastal waters. Concentrations of PAH were measured in the atmosphere, water column, and sediment at four water-quality impaired sites in southern California: Ballona Creek Estuary, Los Angeles Harbor, Upper Newport Bay, and San Diego Bay. These concentrations were used to calculate site-specific sediment/water and atmosphere/water exchange fluxes. The net sediment/water exchange of total PAH (*t*-PAH) was positive, indicating sediments were a source to the overlying water column. Furthermore, the net atmosphere/water flux (gas exchange + dry particle deposition) of *t*-PAH was typically positive also, indicating the water column was a net source of PAH to the surrounding atmosphere through gas exchange. However, in all cases, the magnitude of the diffusive flux of PAH out of the sediments and in to the water column far exceeds input or output of PAH through air/water exchange processes. These results demonstrate the importance of contaminated sediments as a source of PAH to the water column in coastal waters of southern California.

Full Text

ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2008AnnualReport/AR08_051_064.pdf