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

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### ABSTRACT

The present study investigated cross-media transport between both the sediment and the water column and between the water column and the atmosphere, to understand the role of each compartment as a source or a sink of polycyclic aromatic hydrocarbons (PAH) in southern California, USA, 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 that sediments were a source to the overlying water column. Furthermore, the net atmosphere–water exchange (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 into the water column far exceeded input or output of PAH through air/ water exchange processes. These results demonstrate the potential importance of contaminated sediments as a source of PAH to the water column in coastal waters of southern California.

### Full Text

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