

Multi-media screening of contaminants of emerging concern (CECs) in coastal urban watersheds in southern California (USA)

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ABSTRACT

To examine the occurrence and fate of contaminants of emerging concern (CECs) and inform future monitoring of CECs in coastal urban waterways, water, sediment and fish tissue samples were collected and analyzed for a broad suite of pharmaceuticals and personal care products (PPCPs), commercial/household chemicals, current use pesticides and hormones in an effluent-dominated river and multiple embayments in southern California (USA). In the Santa Clara River (SCR), which receives treated wastewater from several facilities, aqueous phase CECs were detectable at stations nearest discharges from municipal wastewater treatment plants but were attenuated downstream. Sucralose and the chlorinated phosphate flame-retardants TCPP, TDCPP and TCEP were most abundant in water, with maximum concentrations of 35, 3.3, 1.4 and 0.81 ug/L, respectively. Triclocarban, an antimicrobial agent in use for decades, was more prevalent in water than triclosan or nonylphenol. Maximum concentrations of bifenthrin, permethrin, polybrominated diphenyl ethers (PBDEs) and degradates of fipronil exceeded CEC-specific monitoring trigger levels (MTLs) recently established for freshwater and estuarine sediments by factors of 10 to 1000, respectively. Maximum fish tissue concentrations of PBDEs varied widely (370 and 7.0 ng/g for the SCR and coastal embayments, respectively), with most species exhibiting concentrations at the lower end of this range. These results suggest that continued monitoring of pyrethroids, PBDEs and degradates of fipronil in sediment, is warranted in these systems. In contrast, aqueous pharmaceutical concentrations in the SCR were not close to exceeding current MTLs, suggesting a lower priority for targeted monitoring in this medium. This article is protected by copyright. All rights reserved

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