Variations in surface water concentrations and composition of per- and polyfluoroalkyl substances in an urban estuary and its accumulation in key estuary resident species.

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Contamination of estuaries with per-and polyfluoroalkyl substances (PFAS) is a pressing issue with a need for research on its accumulation and impact on estuarine biota. This study aimed to determine the variation in concentrations of PFAS in the Swan and Canning Estuary system in Perth, Western Australia and the accumulation of these compounds in aquatic species. PFAS concentrations in surface water were sampled six monthly for two years at 52 sites throughout the estuary and catchment. To assess the impact on biota, two estuarine resident species, *Acanthopagrus butcheri* and *Portunas armatus* were collected in estuary. The surface water total PFAS concentrations were consistent between the two regions of the estuary, however the composition differed with PFOS and PFHxS the dominant compounds in the Swan Estuary and short chain compounds more prevalent in the Canning Estuary. This spatial difference in concentration was reflected in biota, with concentrations highest in female *A. butcheri* from the Swan Estuary. Tissue partitioning was highly dependent on sex, with highest concentrations detected in *A. butcheri* ovaries and the viscera of female *P. armatus*. This research furthers our understanding of environmental PFAS concentrations and highlights potential impacts to estuarine biota, particularly the females of each species.

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