

African Journal of Aquatic Science

PAHs, OCPs and PCBs in sediments from three catchments in Durban, South Africa

T Vogt^{1*}, R Pieters¹ and BK Newman^{2,3}

¹ Unit for Environmental Sciences and Management, North-West University, Potchefstroom, South Africa

² Coastal Systems Research Group, Council for Scientific and Industrial Research, Congella, Durban, South Africa

³ Nelson Mandela University, Port Elizabeth, South Africa

*Corresponding author, email: tash.vogt@gmail.com

Abstract

Polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs) and polychlorinated biphenyls (PCBs) were analysed from sediment samples collected in 2012 from rivers, surface runoff canals and estuaries in three highly urbanised catchments in Durban, KwaZulu-Natal, South Africa. PAHs were ubiquitous, at concentrations between 36–6 800 ng g⁻¹ dry mass (dm). Congener ratio diagnosis suggests the PAHs were derived predominantly from pyrogenic sources. Four OCPs and/or their metabolites were detected at varying frequencies and concentrations. Of these, dichlorodiphenyltrichloroethane (ddT) and metabolites were most frequently detected and were at a high concentration in sediment in some systems. Toxaphene was detected at a high concentration at some sites. The total PCB concentration varied widely, from below the method detection limit to 110 ng g⁻¹ (dm). Based on the comparison of chemical concentrations to international sediment quality guidelines, PAH, OCP and PCB concentrations in most sediment samples posed a low risk to sediment-dwelling organisms. However, in some instances the risk was moderate or high. It is recommended that these compounds be monitored more frequently and comprehensively in aquatic ecosystems to better understand the ecological and human health implications.