SOURCES AND TRANSPORT OF (MICRO)PLASTIC IN URBAN RIVERS: FIELD STUDY IN THE HILLSBOROUGH RIVER

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Plastic has become a major source of contamination for the world's water. Urbanization and population density have a direct impact of plastic pollution in river systems, yet there is a lack of data and knowledge on sources and transport of plastics from urban catchments. Although listed as a pollutant in the U.S. Clean Water Act, plastic is currently not regulated. The objective of this study is to investigate tempo-spatial variations in plastic loads through an urban coastal river system with the ultimate goal to enhance the development of mitigation and prevention strategies. Our three sites are strategically located along the Hillsborough River as it meanders through Tampa before discharging in Tampa Bay and the Gulf of Mexico. They represent distinct degrees of flow accumulation and increasing urbanization to assess the impact of the city. The river cross-sections were sampled with a neuston net (500 µm mesh size) and an Acoustic Doppler Current Profiler (ADCP) was used to create corresponding flow and discharge profiles. We collected 18 months data of plastic concentrations in 2018 and 2019, capturing two wet seasons and one dry season. Plastic release is linked to rainfall and runoff and therefore peaks after storm events. At our baseline site, plastic concentrations are very low; from there, loads are noticeable increasing as the river passes through the city. We found plastic concentrations up to 25 counts/m3, with a majority floating at the river surface. In high flow conditions, plastics are also re-suspended from the riverbed. Sizes range typically between 500 µm and 10 cm. This is a first comprehensive study of urban plastic pollution in a Florida river. This research serves to close some of the current data gaps and supports efforts to incorporate plastic as a pollutant into stormwater and waste management practices.

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