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Distribution and Sedimentation of Microplastics in Taihu Lake

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Microplastics have been reported in environmental media for decades, but gaps in our knowledge about them still remain. We investigated the third biggest freshwater lake in China – Taihu Lake – and the 30 major rivers around it. Microplastics were detected in lake water and sediment, and in river water, at abundances varying from 1.7 to 8.5 items/L, 460 to 1380 items/kg and 1.8 to 18.2 items/L, respectively. Inflow rivers were more polluted with microplastics than outflow rivers. The most common shape was fragment. Microplastic sizes of < 100 μm dominated in inflow rivers, 100–200 μm dominated in lake water and outflow rivers. The average size of microplastics in outflow rivers (200.4 μm) was larger than that in inflow rivers (166.2 μm). Microplastics of < 100 μm only accounted for 28% in the lake surface water but were as high as 70% in the sediment, indicating that smaller microplastics may more easily settle in the lake. The main components of the microplastics were identified as being polyvinyl chloride and polyethylene. There were about 1.2×10^6 items/s microplastics entered Taihu Lake. Four main rivers located at northwestern lake accounted for 79% of the total inflow microplastic fluxes.