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Floating particles transport velocity and trapping mechanisms along vegetated riverbanks

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The presence of floating microplastics (MP) in the environment, for example in the Forth and Clyde canal and the Thames river, accumulates in oceans and is globally problematic and a growing concern. It is estimated that the amount of plastic that flows into the world's oceans each year is between 5 and 13 million tons. MPs are being released on land and are either deposited as sediment, captured in vegetation or transported along fluvial pathways to run off into the ocean. Previous studies suggest different pathways to reach the ocean including via the waste water, atmospheric deposition and storm water. There has been little research considering the issue of transportation of floating particles into rivers.

This research focuses on experimentally identifying floating plastic particles transport velocities and trapping mechanisms along streams with vegetated riverbanks (Valyrakis et al 2015, Liu et al 2017). A total of 540 videos (Liu and Valyrakis 2017), were analyzed to assess the effect of size, shape and transport location of floating large micro-plastics. Six different sizes of floating particles, of two shapes (circular and rectangular), and five different release locations across and in the vicinity of the vegetated riverbank, are assessed to probe their effect on floating particles transport. The time taken and distance travelled of a particle over the one-meter long test area are used to determine the particle velocities and entrapment probabilities for the various arrangements tested herein.

References

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