

Community beach clean-ups could beat high-tech solutions for clearing plastic pollution

April 23 2024, by Alan Williams



Richard Thompson OBE FRS. Credit: University of Plymouth

Local community beach cleans could be more effective than high-tech, but often unproven, removal technologies at limiting ocean plastic's harm to the environment and humans, according to a new report.

Published to coincide with the latest round of United Nations Plastics Treaty negotiations, in Ottawa, Canada, the [summary report](#), "Legacy plastics: technologies and interventions to remove existing plastic from [aquatic environment](#)," looks at how and where plastic removal can be most effective.

The single most important factor identified in the report is preventing [plastic waste](#) entering the environment in the first place.

However, it concludes some plastic removal will be beneficial as already high, environmental plastic concentrations are expected to triple by 2060 under business-as-usual scenarios.

It recommends that priority areas for clean-up be identified according to where plastic poses the [greatest threats](#) to ecosystems or human well-being, not just where concentrations are highest.

Professor Richard Thompson OBE FRS, Professor of Marine Biology and Head of the International Marine Litter Research Unit at the University of Plymouth, is the report's lead author.

"Although clean-up is not the solution to the plastic problem, there are circumstances where it may be beneficial, both to protect ecosystems and limit any potential harm to human health. It is essential that any technologies designed to remove [plastic pollution](#) from the environment are properly evaluated before they are deployed to ensure they are effective and there are no unintended environmental impacts.

"However, the focus must remain on prevention, rather than symptom management, as a solution to plastic pollution," says Richard Thompson OBE FRS head of the International Marine Litter Research Unit.

About 88% of marine plastics are predicted to accumulate close to the

shoreline, often on beaches and in estuaries. These areas typically support highly productive ecosystems with high economic value as tourism destinations, elevating the potential benefits of clean-up efforts.

While research and [technology](#) will have an important part to play, particularly in helping identify environmentally vulnerable "hotspots," many proposed clean-up solutions are context specific and therefore a range of solutions will be required to target different circumstances.

The report evaluated a range of clean-up approaches but found many technologies lack evidence on their effectiveness, scalability, and any negative environmental impacts. Where evidence does exist, it confirms the potential for environmental impacts.

In the absence of clear evidence on the overall benefits of technological clean-up, [policy makers](#) should focus on relatively low-tech solutions like beach and river clean-ups, which have a low environmental impact and range of co-benefits.

In the report, marine biologists and ecologists comment on a range of technologies designed to combat and clear plastic pollution, including ocean booms, magnetic separation, graphene carbon fiber aerogels, and beach hoovers.

While many methods showed promise in clearing some plastic from specific environments, the report concludes that few could be used at scale or in a range of different environments. The environmental cost of many of these technologies is also largely unknown and should be fully evaluated before they are implemented more widely.

Despite this lack of evidence on efficacy, of the 27 plastic removal technologies evaluated in the report around two thirds are currently being manufactured and are ready for use.

Alongside technologies designed to remove plastic from the environment, the [report](#) also looked at techniques that could be used to identify plastic pollution hotspots to help prioritize areas for clean-up.

Modeling could help to predict where plastic pollution may accumulate in the ocean, while drones could quantify and identify plastic on shorelines, potentially helping to prioritize locations where clean-up would be most valuable and effective.

More information: Legacy plastics: interventions to remove existing plastic from aquatic environments: [royalsociety.org/news-resource ...
cts/legacy-plastics/](https://royalsocietypublishing.org/journal/rsos/10/1/230401)

Provided by University of Plymouth

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