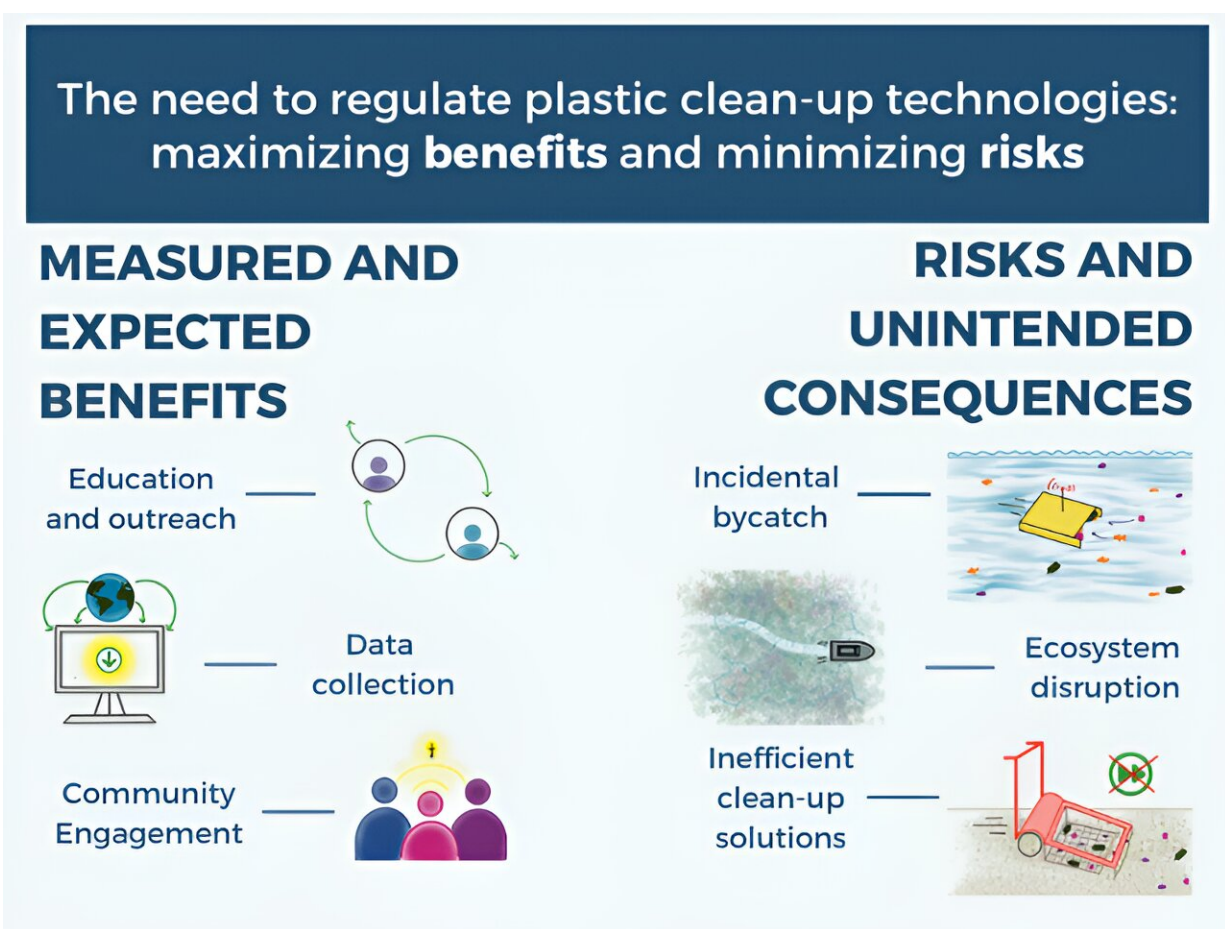


The 'plastic paradox': Some clean-up technologies do more harm than good, researchers say

October 3 2023, by Jannike Falk-Andersson



Credit: *Environmental Science & Technology* (2023). DOI: 10.1021/acs.est.3c01885

The ever-increasing problem of plastic pollution has prompted widespread efforts to combat it through innovative clean-up technologies. These advancements, however, often seen as the silver bullet to solve our plastic crisis, sometimes do more harm than good.

This plastic clean-up paradox is addressed in a [recent publication](#) in *Environmental Science & Technology*, where a group of stakeholders representing different perspectives were brought together to discuss this pressing issue.

The consensus emerging from the dialog is clear: clean-up technologies must be regulated within the framework of an [international plastics treaty](#) to ensure they genuinely benefit the environment.

In other words: We must adopt a philosophy of "clean it up, not mess it up."

Capture plastics, not turtles

So why the caution? When we target litter, we obviously encounter ecosystems teeming with life. Dragging a net across the ocean to capture plastics may unintentionally trap the very organisms we aim to protect, like the unfortunate turtle ensnared in our well-intentioned efforts.

Moreover, the effectiveness of a technology at one place may be impractical in another. Consider the case of the clean-up equipment supplied to the Sri Lankan government following the X-Press Pearl disaster, where plastic nurdles inundated the environment. This technology was designed for dry surfaces, but the nurdles had seeped into wet substrates, so that the equipment was inadequate. The lack of funds and capacity for repairs meant that manual clean-ups were more cost-efficient. This underscores the importance of evaluating [cost-effectiveness](#) before selecting a clean-up approach for a specific area.

Litter concentration also plays a key role. Many clean-up technologies are tailored for oceanic debris, but the densest accumulations are often found on shorelines. The cost of implementing clean-up technologies also increases the more difficult the area is to access, with seafloor and open-ocean clean-ups having very high capital costs.

To get more bang for the buck we should therefore support projects focusing on areas that are the most polluted and can be cleaned relatively effortlessly.

Post clean-up issues

We also know very little about what happens to the litter after it has been removed from the environment. The litter must be sorted, transported, and processed. All these steps may include unexpected hick-ups. In many cases, most of what is trapped is organic material. This must be removed, and the litter cleaned and sorted into fractions that hopefully can be recycled.

Transporting litter across national jurisdictions may not be easy. Safe deposit or recycling facilities might be unavailable locally, increasing the risk that the plastic recovered end up in places it shouldn't—like back into the ocean.

It has also been shown that plastic that has been in the ocean are of low quality, making it difficult to recycle.

To ensure that clean-ups provide a net benefit, we must carefully consider these factors.

How to maximize the impact of clean-up technologies

Efforts to reduce litter in the environment, including the use of clean-up technologies, hold great promise. However, we must consider how to harness their full potential.

First, understanding the types of litter found provides valuable insights for [decision-makers](#) aiming to prevent further littering. Data collection is paramount.

Additionally, the operation and effectiveness of clean-up technologies can inform outreach programs, inspiring greater public involvement in addressing the plastic crisis. Managing technology, encouraging communication, and promoting litter reuse and recycling can also create economic opportunities and meaningful employment.

To ensure we make the most of these efforts, we advocate for the implementation of guidelines and regulations related to clean-up technologies within the international plastics treaty. This step is vital for robust evaluation processes, efficient deployment of clean-up technologies, proper documentation of [litter](#)'s fate, and enhanced monitoring and outreach efforts.

By doing this, clean-up technologies can be part of the solution to [plastic](#) pollution, allowing us to be cleaning up without messing up.

More information: Jannike Falk-Andersson et al, Cleaning Up without Messing Up: Maximizing the Benefits of Plastic Clean-Up Technologies through New Regulatory Approaches, *Environmental Science & Technology* (2023). [DOI: 10.1021/acs.est.3c01885](https://doi.org/10.1021/acs.est.3c01885)

Provided by Norwegian Institute for Water Research (NIVA)

Citation: The 'plastic paradox': Some clean-up technologies do more harm than good, researchers say (2023, October 3) retrieved 2 May 2024 from <https://phys.org/news/2023-10-plastic-paradox-clean-up-technologies-good.html>

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