

# The Rapids

## US EPA's Trash Free Waters Monthly Update

### October 2024

[epa.gov/trash-free-waters](https://epa.gov/trash-free-waters)

---

#### Introduction

Hello all,

The Trash Free Waters program is hosting a webinar on the [Report on Microfiber Pollution](#) released in July. See “Upcoming Events” section below for details.

The first-ever global plastic pollution [inventory](#), recently published in the journal Nature, demonstrates the tremendous scale of plastic pollution worldwide. University of Leeds researchers used AI to examine waste management practices in over 50,000 municipalities around the world. The researchers found that a whopping 52 million tonnes of plastic pollution entered the environment in 2020.

In addition, Upstream has released the [Conscious Cafeteria Project Report](#) which completes a national study of 15 elementary schools that switched to reusable stainless steel Ahimsa trays and in some cases utensils in 2024. The report dives into the anticipated environmental and economic impacts of switching while making the case for transitioning away from single-use foodware. The average annual savings included over \$2,800 in cost savings; 3,300 pounds of waste eliminated; and over 70,000 single-use items eliminated.

Finally, Surfrider has launched an [Ocean Friendly Hotels Program](#) to complement its Ocean Friendly Restaurants Program. To join, hotels must follow a set of mandatory and optional criteria that focuses on single-use plastic reduction and more.

Please share any upcoming events with me at [nandi.romell@epa.gov](mailto:nandi.romell@epa.gov) so that the Trash Free Waters Team can advertise these opportunities.

Romell Nandi  
US EPA  
Trash Free Waters National Program Lead

---

References to any non-federal entity, its products, services or enterprises does not imply an endorsement by the US government or the EPA and is provided for informational purposes only. The EPA and its employees do not endorse any commercial products, services or enterprises. The EPA is also not responsible for information on external websites and linking to external websites does not imply or express an endorsement of any non-federal entity, product or service on external websites.

#### EPA Announcements

The EPA has also developed a [new resource](#) for the procurement of sustainable food service ware products. The resource discourages the use of single-use plastics and divides the products into three types—reusable, compostable, and recyclable—providing recommendations for each. The site also includes a list of resources to delve deeper into the topic.

The EPA released a new website, [Climate Resilience and Adaptation Funding Toolbox \(CRAFT\)](#), to support technical assistance providers as they work with external partners looking to invest in climate-resilient projects. Technical assistance providers can voluntarily use CRAFT for pre- and post-application support as they work with funding applicants and recipients.

#### Funding Opportunities

**The EPA Solid Waste Infrastructure for Recycling and Recycling Education and Outreach Grant Programs**

The EPA recently announced it is making \$117 million available for three separate funding opportunities to advance recycling infrastructure and boost food waste prevention education across the country. Two of the notices are for Solid Waste Infrastructure for Recycling grants – one funding opportunity for [Tribes and intertribal consortia](#) and another for [communities](#) (such as cities, counties, and parishes) across the country. Applications are due for SWIFR grants for Tribes by **March 14, 2025**, and for communities by **December 20, 2024**. The third notice is for EPA's [Recycling Education and Outreach grant program](#) which is focused on food waste prevention and composting. Applications are due for the REO grants by **December 20, 2024**.

### [The EPA Gulf of Mexico Division Funding Opportunities](#)

The EPA Gulf of Mexico Division is pleased to announce the opening of four Gulf of Mexico Funding Opportunities. View all four opportunities on [EPA's Gulf of Mexico webpage](#). Specific grants include:

- [Understanding Water Quality through Monitoring Activities](#)
- [Trash Free Waters – Micro/Nanoplastics in the Gulf of Mexico](#)
- [Fisher-Led Aquatic Trash Prevention and Abatement in Urban and Inland Disadvantaged Communities](#)
- [Trash Free Waters Art and Slogan Competition](#)

### [The EPA Community Change Grants Program Update](#)

The EPA has published an updated version of the Notice of Funding Opportunity for the Community Change Grants Program. This new version replaces the previous versions of the Notice of Funding Opportunity. The first change is to the EPA [map](#) used to identify disadvantage communities and the second change is to remove the oral presentation requirement for the Track 1 Application process. The program is still accepting applications through **November 21, 2024**.

### [Marine Debris Removal and Interception Technologies Grants Fiscal Year 2025](#)

NOAA's Marine Debris Program is pleased to announce two Notices of Funding Opportunity for Marine Debris Removal and Interception Technologies under the Bipartisan Infrastructure Law. NOAA will award up to \$54 million to support impactful, large marine debris removal projects, as well as the installation of proven marine debris interception technologies, throughout the coastal United States, Great Lakes, United States territories, and Freely Associated States. For more information, please visit the [Removal](#) and [Interception Technologies](#) opportunities on Grants.gov and the NOAA Marine Debris Program's [website](#).

### [The EPA to Award \\$9.75 Million in Grants to Support Water Quality Monitoring and Protect the Health of Beachgoers](#)

In June, the EPA announced almost \$10 million in grant funding to help coastal and Great Lakes communities protect the health of beachgoers. About 40 states, territories and Tribes will use the funding to test beach waters for harmful bacteria, identify sources of pollution and notify the public.

---

## Upcoming Events

### [Organic Waste Management as Part of a Local Circular Economy](#)

*October 2, 2024, (8 am ET), virtual*

Please join the U.S. Agency for International Development's Clean Cities, Blue Ocean's new training to learn more about the essential components of organic waste management, including community composting and the significant value that high-quality compost can bring to local waste management strategies, agriculture and climate mitigation plans. Program partners from Sri Lanka and the Maldives will also share their experiences in implementing various organic management models.

### [Policy Scenarios for Eliminating Plastic Pollution by 2040](#)

*October 2, 2024, (8 – 9:15 am ET), virtual*

The Organization for the Economic Co-operation and Development is hosting a Green Talks LIVE webinar to launch a new OECD report Policy Scenarios for Eliminating Plastic Pollution by 2040. Following an introduction by

Jo Tyndall, Director of the OECD Environment Directorate, OECD Environment Senior Economist Rob Dellink and Junior Policy Analyst Elena Buzzi will delve into the potential environmental benefits and economic consequences of five levels of international policy ambition towards ending plastic pollution by 2040. Country representatives will join to discuss the implications of these findings in the context of efforts to establish a global plastics treaty. The webinar will be moderated by Shardul Agrawala, Head of the Environment and Economy Integration Division at the OECD Environment Directorate.

### **Microplastics in the Estuary**

*October 2, 2024, (12:30pm-4pm), New York, NY*

Join The Citizens Advisory Committee of the New York – New Jersey Harbor & Estuary Program at the Hudson River Wetland (Pier 40, New York, NY 10014) for a Microplastics in the Estuary discussion. This in-person meeting is being held in coordination with partners at Hudson River Park Trust and will feature professionals sharing their efforts on the topics below:

- Impacts of Microplastics on the health of our communities and environment;
- Innovative practices and projects focusing on Microplastics prevention; and
- Local community-led efforts and larger regional research to monitor Microplastics in the Estuary.

### **Addressing Vape Product Waste: Management Challenges and Policy Solutions**

*October 2, 2024, (1 – 2:30 pm ET), virtual*

The Product Stewardship Institute is holding a webinar focused on the disposal of vapes (a.k.a. vape products, electronic cigarettes, e-cigarettes). Managing vape product waste is a growing concern as most consumers' improper disposal in household trash leads to battery fires and environmental contaminants. This webinar will cover the full breadth of vape product waste, including generation, state and local policy options, best management practices, challenges, and successes for this complex product. Participants will hear from a local government about the operational details of waste management, including insights from Boulder County's Vape Aware program, which offers community vape waste disposal opportunities. The Product Stewardship Institute will share policy options identified through a research project conducted for Boulder County. Additionally, we'll hear from the Minnesota Pollution Control Agency about specific challenges and complexities of vape end-of-life management, and from the Environmental Health Initiative at University of California about the broader environmental issues associated with vape product waste disposal.

### **National Zero Waste Virtual Conference**

*October 2-3, 2024, virtual*

Zero Waste USA is hosting its annual virtual conference in October. The first day will focus on Zero Waste Businesses and Institutions, while Day 2 will focus on Zero Waste Communities. The [detailed program](#) is available.

### **Diverse Solutions to Meet the Supply of Bio-Medical Plastic Waste**

*October 3, 2024, (1:30 – 3 pm ET), virtual*

The Northeast Recycling Council is hosting a webinar to discuss how to reduce and divert plastic waste from landfills or incineration in biomedical laboratories and facilities. Hearing from players across the value chain, they will explore opportunities to build a circular infrastructure for a myriad of plastic waste streams, from products to packaging, inherent to the life sciences industry. Speakers include: Katherine Hofmann, Sustainability Manager for Eastman Chemical Company; Sam White, Chief Executive Officer for GreenLabs Recycling and James O'Brien, CEO and Co-Founder of Polycarbin.

### **How the United Nations Treaty Could Change the Global Plastics Industry**

*October 8, 2024, (10 am ET), virtual*

Plastic News is holding a webinar to discuss the UN plastics treaty, which will have a great impact on the global plastics industry long-term. This webinar will talk about the key players in the negotiations and their positions as well as what's likely to happen and on what timeline. Speakers include Kate Bailey, Chief Policy Officer for The Association of Plastics Recyclers; Stewart Harris, Managing Director of Global Affairs for the American Chemistry Council; and Patrick Krieger, Vice President of Sustainability for the Plastics Industry Association.

### **From Gear to Ghost: Reeling in the Problem**

*October 8, 2024, (4 pm ET), virtual*



Tropical Islands Partnering on Solutions for Marine Debris is a bimonthly online webinar series hosted by the NOAA Marine Debris Program. The goal of the series is to help island communities connect and share perspectives from across the tropics on common marine debris issues and proposed solutions. This webinar will feature presentations from various organizations who engage in abandoned, lost or otherwise discarded fishing gear mitigation efforts. Presenters will speak to prevention and removal initiatives aimed to "reel in the problem."

#### [Seizing the Circular Economy Opportunity: A Guide for Marketers](#)

*October 9, 2024, (10 am ET), virtual*

The Ellen MacArthur Foundation is hosting a webinar to explore how circular economy strategies can drive brand growth, strengthen customer loyalty and position an organization as a circular economy leader. Whether you are new to the circular economy or looking to deepen your understanding, this webinar will equip you with actionable insights to drive meaningful change.

#### [Trash Free Waters Webinar: Microfibers are a Macro Issue: Interagency Report on Microfiber Pollution](#)

*October 17, 2024, (1 pm ET), virtual*

In July 2024, the Trash Free Waters program and the National Oceanic and Atmospheric Administration's Marine Debris Division – on behalf of the [Interagency Marine Debris Coordinating Committee](#) - released the [Interagency Marine Debris Coordinating Committee Report on Microfiber Pollution](#). This Report to Congress was mandated by Section 132 of the Save Our Seas 2.0 Act of 2020. This webinar will cover the details in the report as well as some of the ongoing efforts in the United States and beyond that are addressing microfiber pollution.

#### [Fibre Fragmentation & Environmental Pollution Webinar](#)

*October 17, 2024, (10 am ET), virtual*

The Microfibre Consortium is hosting a webinar on the topic of Fibre Fragmentation and Environmental Pollution as part of their 'Triple Planetary Impact' series. Industry specialists will discuss latest research developments and the need to embed fibre fragmentation as an integral part of broader environmental sustainability, and more focused material strategies. It is critical that the industry embraces scientific evidence about the multifaceted risks posed by fibre fragmentation. This webinar is intended to support industry understanding of the issue from an environmental pollution standpoint, so that organizations can act to address the issue with urgency.

#### [Plastics 101 Webinar Series: Plastic Production and Design](#)

*October 17, 2024, (12 – 2 pm ET), virtual*

The National Academies Roundtable on Plastics will hold its second webinar in its Plastics 101 series: Plastic Production and Design on Thursday, October 17, 2024, from 12:00 PM-02:00 PM ET. Additional details will be forthcoming.

#### [2024 Paper & Plastics Recycling Conference](#)

*October 23 – 24, 2024, Chicago, IL*

Recycling Today is sponsoring the longest-running conference and trade show in the paper and plastics recycling industries. The two-day conference includes an [agenda](#) covering hot topics like Extended Producer Responsibility, the status of the recycling industry and developments in chemical recycling methods.

#### [The New Integrated Marine Debris Observing System: Coordinating the Global Community to Provide Data to Inform Policy](#)

*October 23, 2024, (10 am ET), virtual*

The Integrated Marine Debris Observing System (IMDOS), supported by GEO Blue Planet and the Global Ocean Observing System, is establishing a global ocean observing system to provide open access data on marine litter and also provide coordination and guidance for the global marine debris community. An integrated global marine debris observing system is essential for accurately assessing the extent of marine debris pollution and determining mitigation actions. In the context of the Intergovernmental Negotiating Committee developing an international legally binding instrument on plastic pollution, IMDOS will foster the delivery of the necessary data to inform effective actions, set realistic targets, and develop, implement, and adjust policies. In addition, projects working on the global observation, monitoring and forecasting of marine litter can make their work visible in the IMDOS directory of initiatives. Being part of this directory will also give practitioners direct access to all news and

events that IMDOS will be organizing.

---

## ***Save the Date for Future Months...***

### **Fibre Fragmentation & Biodiversity Loss Webinar**

*November 14, 2024, (11 am ET), virtual*

The Microfibre Consortium is hosting a webinar as part of its 'Triple Planetary Impact' series, to discuss fibre fragmentation and biodiversity loss. Industry specialists will discuss latest research developments and the need to embed fibre fragmentation as an integral part of broader environmental sustainability, and more focused material strategies. This webinar is intended to support industry understanding of the issue from a biodiversity loss standpoint, so that organizations can act to address the issue with urgency.

### **Bays and Bayous Symposium**

*November 19 -20, 2024, Biloxi, MS*

This two-day event will bring together leading scientists, educators, and coastal experts to explore, share, and learn about the unique ecosystems of the Gulf of Mexico. Top scientists from universities, non-governmental organizations and government agencies share their latest research findings. Educators and extension professionals also share their successful outreach efforts and educational initiatives to drive change in communities. The conference will also provide networking opportunities among all types of organizations.

### **SPARKS 2024**

*December 9 -10, 2024, Seattle, WA*

Sponsored by the Pacific Northwest Social Marketing Association, SPARKS is an annual social marketing conference, covering two days of insights and instruction from prominent voices in the field. The event features more than a dozen social marketing experts speaking on behavior change related to some of the most urgent issues we face, including public health, injury prevention, environmental health and protection, and community well-being in the Pacific Northwest.

### **Fibre Fragmentation and Climate Change Webinar**

*December 12, 2024, (11 am ET), virtual*

The Microfibre Consortium is hosting a webinar in part of its 'Triple Planetary Impact' series to do a deep dive into fibre fragmentation and climate change. Industry specialists will discuss the latest research developments and the importance of making fibre fragmentation a part of material strategies. This webinar is intended to support industry understanding of the issue from a climate change standpoint, so that organizations can act urgently.

### **Circularity 25**

*Apr 29, 2025 - May 01, 2025, Denver, CO*

Circularity offers thought-provoking keynotes, actionable breakouts, a solutions-oriented expo and networking opportunities for leaders implementing circular solutions. Join the growing community of visionaries and practitioners to move beyond incremental action, catalyze systems change and accelerate the circular economy.

---

## ***In Case You Missed It...***

### **Circular Economy Learning Series**

The U.S. Agency for International Development's Clean Cities, Blue Ocean program held a Circular Economy Learning Series, which was dedicated to sharing how the program and its focal country partners are advancing circular economies to address ocean plastic pollution. This series of virtual sessions was organized thematically, aligning with USAID's Building Blocks of a Circular Economy. Sessions included: Promoting Data Driven Strategies, Improving Solid Waste Infrastructure, Creating Green Jobs, Encouraging Sustained Behavior Change to Reduce Single-Use Plastics and Fostering an Inclusive, Just, and Equitable System.

### **Be a Better Coastal Adaptation Practitioner with Behavior Change**

In this webinar, the Center for Behavior and Climate showed how to incorporate behavioral tools into coastal adaptation efforts to improve the likelihood of success for community projects and policy initiatives alike. The webinar also taught five evidence-based techniques (social norms, efficacy, legacy motivation, nudge, and framing) to reach different audiences.

### [The Music Industry's Plastic-Free Evolution](#)

The Plastic Pollution Coalition held a webinar to discuss plastic use in the music industry. The webinar focused on how artists can reduce their single-use plastic on the road, on tour buses, backstage, and on stage. It also discussed how the music industry can make the connections between the climate crisis, the petrochemical industry, fossil fuels, and plastic pollution. And finally, how musicians can demonstrate their commitment to these issues. Speakers included the Associate Senior Director of the Think 100% podcast for Hip Hop Caucus, Jasmine Gil; Grammy-nominated singer-songwriter, musician Grace Potter; and Sustainability Coordinator for Jack Johnson Music & All at Once Max Tischler.

### [Building Reusable Packaging Systems: Case Studies and Practical Steps for Municipalities](#)

In this webinar hosted by the Product Stewardship Institute, earthday365 discussed the barriers they encountered, the lessons they learned, the progress made and next steps for reuse in St. Louis. r.World, a reusable packaging solutions company, presented about their work with earthday365 in St. Louis to conduct a feasibility study for centralized packaging reuse services. Finally, Seattle Public Utilities spoke about the award-winning Reuse Seattle program which is building citywide reuse systems. In addition, the Product Stewardship Institute released its [municipal guide](#) to supporting and investing in packaging reuse systems, which complements PSI's plastic reduction guides for [restaurants](#) and [universities](#). The webinar provided recommendations that municipalities, businesses, and organizations can undertake to invest in reusable packaging systems in their communities.

### [Fibre Fragmentation and the Triple Planetary Impact](#)

In June 2024, The Microfibre Consortium provided an update on scientific research connecting fibre fragmentation to three interlinked crises: biodiversity loss, environmental pollution and climate change. Speakers included Bettina Heller from the United Nations Environment Programme and Janne Koopmans from Zero Discharge of Hazardous Chemicals (ZDHC).

### [Challenges and Opportunities in Biopharma and Medical Institutions](#)

The Northeast Recycling Council held a webinar to discuss how to reduce and divert plastic waste from landfills or incineration in biomedical laboratories and facilities. Hearing from players across the value chain, they explored opportunities to build a circular infrastructure for a myriad of plastic waste streams, from products to packaging, with a wide range of polymers, inherent to the life sciences industry. Speakers included: Avery Palardy, Climate and Sustainability Director, Beth Israel Deaconess Medical Center; Jacqueline Hollands, Global Manager of Product Recycling and Innovation, Life Science Business, MilliporeSigma; Laura Cappellucci, Global Sustainability Lead, Takeda Pharmaceutical Company Limited/BioLife Plasma Services, and Sarah Dowdall, Program Director, Coming Life Sciences.

### [Policy Matters: Finalizing the UN Plastics Treaty](#)

The Plastic Pollution Coalition held a webinar to discuss the upcoming United Nations Plastics Treaty negotiations. With the treaty, world leaders now have a momentous opportunity to stop plastics, toxic chemicals, and fossil fuels at the source; listen to and support frontline communities facing the worst impacts of pollution and injustice; mitigate the climate crisis and more. The fifth and final planned negotiating session (INC-5) will be held in Busan, Republic of Korea, from November 25 to December 1, 2024. In preparation for this critical meeting, intersessional expert groups have been working to discuss key issues related to treaty implementation and criteria for chemicals of concern. Negotiators will have to overcome diverging views and the numerous unresolved issues in the current draft text from the [previous negotiating session \(INC-4\)](#) in Ottawa, Canada. The Plastic Pollution Coalition hosted a lively discussion about these issues from the perspectives of frontline activism, policy, art, science and law. Speakers included: Frankie Orona, Executive Director, [Society of Native Nations](#); Shiv Srivastava, Policy Director, [Fenceline Watch](#); and Richard Thompson, Professor of Marine Biology, [University of Plymouth](#). The webinar was moderated by Julie Teel Simmonds, Senior Counsel at the [Center for Biological Diversity](#).

---



## FATE AND TRANSPORT OF MICROPLASTICS

### Co-Accumulation Characteristics and Interaction Mechanism of Microplastics and PFAS In a Large Shallow Lake

*Jianchao Liu, Yinuo Xie, Lv Zhou, Guanghua Lu, Yiping Li, Peng Gao and Jun Hou*

This article asserts that microplastics (MPs) and per- and polyfluoroalkyl substances (PFAS) coexist widely in lakes and affect the ecology. The authors examined the characteristics of this co-existence and the adsorption-desorption mechanisms between MPs and typical PFAS were explored in Taihu Lake, one of the largest freshwater lakes in China, described as a typical eutrophic shallow lake. They described the microplastics in the lake as primarily being polyvinyl chloride (PVC) and polyethylene (PE). PFAS were present in the water and in the sediment. The researchers conducted a combination of field investigations and indoor experiments. The field sampling occurred in July 2022 and six sampling sites were designated in the primary bays of Taihu Lake. They found that the distribution of PFAS in the lake is significantly correlated with the shape, color, abundance and size of MPs. Their overall results indicated that MPs in lakes can alter the distribution and ecological effects of PFAS. They concluded that the widespread presence of MPs and PFAS can pose risks to biological health and ecosystem stability in aquatic environments. **Read the full abstract:**

<https://www.sciencedirect.com/science/article/pii/S0304389424023598>

### Transport and Accumulation of Microplastics from Biosolids to Australian Agricultural Soils: Detection of Microplastics Down to 1 $\mu\text{m}$

Shima Ziajahromi, Hsuan-Cheng, LuJason Dwyer, Milena Fernandes, Merran Griffith and Frederic DL Leusch

This article explored one of the impacts associated with the shift towards sustainable agriculture, which involved replacing inorganic fertilizers with organic alternatives like biosolids. The researchers observed that despite the common use of biosolids in Australia, the transfer of microplastics from biosolids to agricultural soils is not well understood. They investigated the abundance, characteristics and transport of microplastics resulting from biosolids application in two agricultural sites in the Toowoomba area Queensland in 2021. Microplastics concentrations were found to be significantly higher in biosolid-amended soils than in reference sites. Furthermore, the microplastic concentrations correlated with the volume, time since application and frequency of biosolids application. The most prevalent types of microplastics were polyethylene, polypropylene and polymethyl methacrylate fragments. Notably, the researchers were able to use Raman spectroscopy and detected smaller microplastics (1–25  $\mu\text{m}$ ) fragments composed of polyethylene, polypropylene and polyvinyl alcohol. They stated that this study provides the first report of microplastics down to 1  $\mu\text{m}$  in Australian agricultural soils. The researchers asserted that their findings indicated a need to assess the long-term impact of microplastics in biosolids on soil health and food safety. **Read the full abstract:**

<https://pubs.acs.org/doi/full/10.1021/acs.est.4c04661>

## MICROPLASTICS EXPOSURE AND IMPACTS

### Revealing The Hidden Threats: Genotoxic Effects of Microplastics on Freshwater Fish

Maiara Menezes Franco Teixeira de Mello, Lucia Ziegler, Bruno Wanderley, Juan Manuel Gutiérrez and Juliana Deo Dias

The goal of this study was to evaluate multiple physiological responses simultaneously to better understand whole-organism effects. The researchers conducted an experiment to assess the effects of microplastics on freshwater fish physiology from the molecular to the organismal level. They used a model species, the common carp, which was selected because of its wide occurrence in fresh and brackish waters of subtropical regions and its commercial relevance in aquaculture, being the fourth species in global fisheries production ranking. The microplastics that were assessed were from recycling industry fragments, ranging from 125-1000  $\mu\text{m}$  in size, and two concentrations levels that were determined to have environmental relevance (0.75 and 8.25  $\mu\text{g/L}$ ). Ninety juvenile fish were divided into groups and exposed to different concentrations of microplastics. The results suggested that exposure to microplastics did not cause adverse effects at the morphological level (variation in size of gut), metabolic (variation of standard metabolic rate) or ecological (growth performance) levels. However, the researchers found that there was an increased frequency of micronucleated cells associated with increasing microplastic concentration, which they described as demonstrating the potential genotoxicity of microplastics and could clearly harm fish health in long-term. According to them, their study results indicated that the manifestation of effects of microplastic exposure may vary over time, which highlighted the need for future

## **MICROPLASTICS POLLUTION MITIGATION AND REMEDIATION**

### **Existence and Fate of Microplastics in Terrestrial Environment: A Global Fretfulness and Abatement Strategies**

Tariqul Islam and Hefa Cheng

According to this review, limited studies exist exploring microplastics pollution and associated risk in terrestrial environment. This article summarized the global distribution of microplastics in the terrestrial environment, their transport pathways and fate, associated risks to both ecosystems and human health and abatement strategies. The authors found that the most prevalent particles in the terrestrial environment were small (<500 µm); fragment, fiber and film shapes; transparent and white in color; polyethylene, polypropylene and polyethylene terephthalate polymers. Their research indicated that microplastics in soils negatively affects organisms living in those soils. They highlighted that the effects of microplastics in the terrestrial environment on human health is poorly understood and recommended further exploration of this subject area. As described, the removal of microplastics from soil environment is quite complex and costly, thus prevention of their releases is preferable. Biodegradation was identified as the abatement method which held the most promise for reducing microplastics in the terrestrial environment. This method was described as harnessing bacterial strains to degrade microplastics through enzymatic hydrolysis. The authors concluded with strong recommendations that global cooperation be strengthened, timely policies on plastic use and recycling be enacted, and new technologies developed for control of microplastics to reduce the pollution in terrestrial environment. They also suggested that the substitution of plastics with biodegradable plastics could help minimize future accumulation of microplastics in terrestrial environment. **Read the full abstract:**

<https://www.sciencedirect.com/science/article/pii/S0048969724063198>

### **Microbial Strategies for Effective Microplastics Biodegradation: Insights and Innovations in Environmental Remediation**

Qianqian Song, Yun Zhang, Cuiping Ju, Tianyu Zhao, Qingxuan Meng and Jing Cong

This review examined the origins, distribution and biological impacts of microplastics, with an emphasis on closely looking at the molecular and cellular mechanisms underlying their toxicity. The authors highlighted the indispensable role of microbial consortia[1] and enzymatic pathways in the oxidative degradation of microplastics. A description of the initial biodegradation studies of polyethylene (PE) in the 1980's was included: PE was degraded using a fungus (*Fusarium*[2] *redolens*) isolated from garden soil, which ultimately produced carbon dioxide. The four stages of the degradation of PE were identified as: depolymerization, fragmentation, assimilation and mineralization. The detoxification capabilities of microbial metabolisms and enzymatic functions was thought to ameliorate microplastics' negative effects. The authors highlighted the need for more research to better understand the complex biodegradation pathways and to develop effective strategies to remove microplastics from ecosystems. Furthermore, they asserted that microbial strategies are at the forefront of remedial interventions and could thereby pave the way for groundbreaking advancements in environmental conservation. **Read the full abstract:** <https://www.sciencedirect.com/science/article/pii/S0013935124019534>

[1] Groups of diverse microorganisms that have the ability to act together in a community.

<https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/microbial-consortium#:~:text=22.3%20Microbial%20consortium-.Microbial%20consortium%20is%20usually%20referred%20as%20group%20of%20diverse%20microorganisms,et%20al.%2C%202007.>

[2] *Fusarium* species are a diverse group of fungi which damage small-grain cereals by rotting the seedlings, roots, crowns and in some cases, infect the heads.

[https://www.researchgate.net/publication/325570058\\_First\\_Report\\_of\\_Fusarium\\_redolens\\_Causing\\_Root\\_and\\_Crown\\_Rot\\_of\\_Barley\\_Hordeum\\_vulgare\\_in\\_Turkey.](https://www.researchgate.net/publication/325570058_First_Report_of_Fusarium_redolens_Causing_Root_and_Crown_Rot_of_Barley_Hordeum_vulgare_in_Turkey.)

### **New Microfiber Filter Device Launches for Home Washing Machines**

Jamie Hailstone

This brief article reports on the effort to launch a microfiber filter device that could be installed on home washing



machines to assist in removing microfibers. [Matter](#), described as a climate technology company, is working with the washing machine manufacturing company Bosch and Siemens with the goal of preventing up to 97% of microfibers from being released during every wash cycle. As described, the filter can be connected to the washing machine's wastewater hose and then placed on or next to the appliance. Additionally, it was easily retrofitted to an existing washing machine regardless of the manufacturer or age of the machine. The device has a self-cleaning system that can go up to six weeks without needing to be emptied and no replacement filters are needed, so the product is expected to last the life of the washing machine. **Read the full abstract:** <https://www.forbes.com/sites/jamiehailstone/2024/09/10/new-microfiber-filter-device-launches-for-home-washing-machines/>

---

## **SCOPE OF MICROPLASTIC POLLUTION**

### **Twenty Years of Microplastics Pollution Research—What Have We Learned?**

Richard C. Thompson, Winnie Courtene-Jones, Julien Boucher, Sabine Pahl, Karen Raubenheimer and Albert A. Koelmans

This review centers on the past twenty years of microplastic pollution research and examines the current understanding of the issue and the impacts, refines definitions and considers future mitigation prospects. The various sources of microplastics and their distribution across environmental compartments (e.g., marine environment, air) were discussed. The authors identified the range of sources: tires, textiles, cosmetics, paint and the fragmentation of larger items. In their discussion of the wide distribution throughout the natural environment, they also included observations and findings about the associated negative effects. They also observed that microplastics are ubiquitous in food and drink and have been detected throughout the human body (e.g., tissues, organs, blood), with emerging evidence of negative effects. The authors also considered available information from forecasting models and cited the finding that environmental contamination could double by 2040, producing widescale harms. Furthermore, they asserted that even if it were possible to halt all new releases of plastic to the environment, the quantity of microplastics would continue to increase over the foreseeable future because of the fragmentation of larger items of plastic that are already present. Interestingly, they observed that while new sources, pathways and hotspots of environmental contamination are identified with each new study influencing the 'relative' importance of contributions among sources, the 'absolute' quantities in the environment simply increase. They cited the example of the identification of tire wear particles as a source of microplastics, the importance of which only emerged around 2015, but this did not diminish the numerical abundance of other sources such as fibers and pellets that were already well documented at that time. Consequently, they asserted that it is critical to address microplastics at the source. **Read the full abstract:** <https://www.science.org/doi/10.1126/science.adl2746>

---





U.S. EPA Office of Water | 1200 Pennsylvania Ave NW | Washington, DC 20460 US

[Unsubscribe](#) | [Update Profile](#) | [Constant Contact Data Notice](#)



Try email marketing for free today!