

# The Rapids

## US EPA's Trash Free Waters Monthly Update

### September 2024

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

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#### Introduction

Hello all,

The White House Council on Environmental Quality recently released the first comprehensive U.S. government plan to target plastic pollution at production, processing, use and disposal. [Mobilizing Federal Action on Plastic Pollution: Progress, Principles, and Priorities](#) outlines existing and new federal actions to reduce the impact of plastic pollution throughout the plastic lifecycle and calls for sustained and coordinated work between relevant federal agencies and state, local, Tribal and Territorial governments, local communities, the private sector and other stakeholders to address the scale and breadth of the plastic pollution challenge.

In July, the [Report on Microfiber Pollution](#) – a requirement of the [Save Our Seas 2.0 Act](#) of 2020 - was submitted to Congress and released to the public. The Trash Free Waters Program co-led the development of this report with the National Oceanic and Atmospheric Administration's Marine Debris Program on behalf of the Interagency Marine Debris Coordinating Committee. The report provides an overview of microfiber pollution while also outlining a plan for federal agencies to address this problem in partnership with other stakeholders.

In addition to the Report on Microfiber Pollution, the [Fighting Fibers Act of 2024](#) has been introduced by U.S. Senator Merkley (OR), specifically to address microfiber pollution from clothing. The Act has two main components: a requirement for washing machines to include microfiber filtration and a requirement for future research on the impact of microfibers.

The Ellen MacArthur Foundation published a new report: [Pushing the Boundaries of Extended Producer Responsibility Policy for Textiles](#). Around the world, over 80% of textiles end up incinerated, landfilled or leaking into the environment when they are discarded. This textile waste is a direct consequence of our linear economic system. The report acknowledges that a circular economy is the only solution that can match the scale of the global textile waste problem and describes how Extended Producer Responsibility policies play an important part in going beyond downstream waste management.

Beyond Plastics recently released a report on [Demystifying Compostable and Biodegradable Plastics](#). This report provides an overview of bioplastic materials currently on the market, the voluntary standards that govern their design and scientific research findings to date on their safety to help individuals make evaluations of their options. It also covers the waste management issues associated with bioplastics and provides a checklist to guide decision-making.

The U.S. Plastics Pact has released a new report [Scaling Impact: The Plastics Pact Network's Six-Year Journey Towards Eliminating Plastic Pollution and Waste](#). The report shares the impact and lessons learned from the past six years of the Plastics Pact Network and highlights their ongoing role in driving local, collaborative action around the world, informing and complementing national policy and a Global Plastics Treaty.

The U.S. Plastics Pact has also released a series of strategic reports on circularity aimed at transforming the lifecycle of plastics in the United States. The newly introduced [Design for Recyclability Playbook, Design for Reuse Playbook and Design for Compostability Playbook](#) collectively offer comprehensive guidelines for ensuring that plastic packaging is designed for continuous reuse, recycling or composting, thereby minimizing plastic waste and mitigating its environmental impact.

Upstream has created a [wash hub map](#) to display the locations of reuse services for returnable packaging in the United States and Canada. The map and region list show the expanse of reuse services infrastructure with logistics and wash facilities that collect, transport, wash, sanitize, dry, store and redistribute durable, returnable packaging. Everyone from small to large-sized entities can utilize these facilities to expand the circular economy.

Finally, [70 international financial institutions](#) representing assets worth \$6.8 trillion called for petrochemical companies to reduce fossil fuel dependency and eliminate hazardous chemicals in plastics. The collective statement, organized by Planet Tracker, requests that petrochemical companies disclose and define strategies, address toxic polymers and chemicals, develop sustainable infrastructure, establish governance and support international agreements.

Please share any reports and 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  
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## **EPA Announcements**

### **Funding Opportunities**

#### **[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.

#### **[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 (links go to grants.gov entry for each funding opportunity):

- [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 disadvantaged 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](#).

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## **Upcoming Events**

### **[Circular Economy Learning Series](#)**

*September 4, 2024, (8 am ET), virtual*

*September 11, 2024, (8 am ET), virtual*

The U.S. Agency for International Development's Clean Cities, Blue Ocean program invites you to be a part of a new Circular Economy Learning Series dedicated to sharing how the program and its focal country partners are advancing circular economies to address ocean plastic pollution. This series comes as Clean Cities, Blue Ocean enters its final year of implementation, offering a unique opportunity to learn from the program and its partners' approaches and lessons learned, as well as access related tools and resources that can further your work. This series of virtual sessions is organized thematically, aligning with USAID's Building Blocks of a Circular Economy. Sessions 1 – 3 were held in August, but Session 4 will be held on September 4 focused on Encouraging Sustained Behavior Change to Reduce Single-Use Plastics and Session 5 will be on September 11 entitled Fostering an Inclusive, Just and Equitable System. Session 1 covered Promoting Data-Driven Policies to Enable a Circular Economy, Session 2 was focused on Improving Solid Waste Services and Infrastructure, and Session 3 was on Creating Green Jobs and Local Innovations. Recordings for each can be found on the website as well.

### **Extending the Life Cycle of Textiles**

*September 10 - 18, 2024, Tuesdays and Wednesdays (2 – 4 pm ET), virtual*

The Northeast Recycling Council is hosting a forum series of sessions. Through a mix of lighting talks, group exercises, Q&A discussion and case studies, this forum series will explore how local communities, states, countries, corporations and technologies can work together to power solutions for reducing textile waste and promoting sustainable practices in the industry. Specific topics include community planning, the policy landscape, corporate strategy and technological innovation.

### **Building Reusable Packaging Systems: Case Studies and Practical Steps for Municipalities**

*September 18, 2024, (1 pm ET), virtual*

The Product Stewardship Institute (PSI) is hosting a webinar to provide insights into the implementation of reusable package systems. In 2021, in collaboration with PSI and with grant funding from the EPA and others, the organization earthday365 embarked on a journey to implement a reusable take-away packaging system with restaurants in St. Louis, Missouri. During this webinar, earthday365 will discuss the barriers they encountered, the lessons they learned, the progress made and next steps for reuse in St. Louis. Viewers will also hear from r.World, a reusable packaging solutions company that worked with earthday365 in St. Louis to conduct a feasibility study for centralized packaging reuse services, and Seattle Public Utilities about the award-winning Reuse Seattle program which is building citywide reuse systems.

### **Plastic Caps and Closures 2024**

*September 18, 2024, virtual*

This conference, organized by Plastics News and Sustainable Plastics, will provide an opportunity for industry leaders to engage in discussions on key trends, opportunities and other critical areas of engagement related to the production of plastic caps, closures and rigid plastic packaging. Sessions will be devoted to areas that affect industry growth including market and consumer trends, economic and resin forecasts, advances in closure development, lightweighting and in-depth conversations on sustainability and recycling-related topics. Attendance is free, but registration is mandatory.

### **International Coastal Cleanup 2024**

*September 21, 2024, location varies*

The Ocean Conservancy is sponsoring the 2024 International Coastal Cleanup in partnership with volunteer organizations and individuals around the globe to remove trash from the world's beaches and waterways. Specific events occur throughout the country.

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



### [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 the [second day](#) will focus on Zero Waste Communities.

### [2024 Coastal and Estuarine Summit](#)

*October 6 – 10, 2024, Washington, DC*

Restore America’s Estuaries is holding the 2024 Summit to bring together the coastal restoration and management communities to explore issues, solutions and lessons learned in their work. The Summit is for coastal stakeholders including managers, restoration practitioners, scientists, educators, students, government officials and federal employees.

### [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 [agenda](#) for the two-day conference covers hot topics like EPR, the status of the recycling industry and developments in chemical recycling methods.

### [2024 Sea Grant Marine Debris Symposium](#)

*November 12 – 14, 2024, hybrid (in-person and virtual options)*

NOAA is hosting a Marine Debris Symposium for insightful discussions about marine debris prevention and removal. Attendees can also learn about collaborative efforts to tackle the pressing issue of marine debris. The Symposium will take place at the NOAA headquarters in Silver Spring, Maryland, with virtual options available.

### [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.

### [Circularity 25](#)

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

As the leading conference for professionals building the circular economy, Circularity offers thought-provoking keynotes, actionable breakouts, a solutions-oriented expo and unparalleled 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.

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

#### [Moving the Needle on Reuse: Reusable Food Service Ware \(Part II\)](#)

Jennie Romer, the EPA’s Deputy Assistant Administrator for Pollution Prevention, and the EPA’s [Environmentally Preferable Purchasing](#) program hosted a webinar to continue the conversation about reusable food service ware, an important strategy for preventing pollution. Reuse experts from across the country discussed how businesses,

cities, states and non-profits are working together to scale reuse in their communities, including a community-wide reusable food service ware system in Hilo, Hawaii, supported through an EPA Pollution Prevention grant. The webinar was hosted by Jennie Romer, the EPA's Deputy Assistant Administrator for Pollution Prevention. Additional speakers included Pat Kaufman, PR3; Margie Bell, Recirclable; Jocelyn Chui, Seattle Public Utilities; Jennifer Navarra, Zero Waste Hawai'i Island; and Alison Rogers Cove, USEFULL. Held in April, a [recording](#) is available for Part 1 of Moving the Needle on Reuse: Reusable Food Service Ware.

### [Existing U.S. Federal Authorities to Address Plastic Pollution Webinar](#)

The Environmental Law Institute hosted a webinar to provide an overview of a recent [report](#) published by ELI and the Monterey Bay Aquarium, which provided a comprehensive overview of the existing legal authorities the U.S. federal government can leverage to achieve the national goal to eliminate plastic released into the environment by 2040 while safeguarding human health and the environment. The authors of the report and plastic and chemical pollution experts provided a presentation on the plastic pollution crisis, an overview of the report, key takeaways and opportunities for the United States domestically.

### [California Ocean Litter Strategy Webinar](#)

The California Ocean Protection Council hosted one of its semiannual webinars on the California Ocean Litter Strategy. Developed in conjunction with the National Oceanic and Atmospheric Administration's Marine Debris Program, the Ocean Litter Strategy provides a framework for preventing and reducing ocean litter in California. This webinar included presentations on policy developments, a modeling tool to combat plastic pollution, global producer responsibility for plastic pollution and abandoned and lost fishing gear. Presenters included: the Surfrider Foundation and the California Product Stewardship Council, the UCSB Benioff Ocean Science Laboratory, the Moore Institute for Plastic Pollution Research and the California Department of Fish and Wildlife.

### [Strengthening Cities' Climate Resiliency through Improved Solid Waste Management](#)

The USAID's Clean Cities, Blue Ocean program hosted a virtual training about how cities can strengthen climate resiliency by improving their solid waste management. This training discussed the connections between climate-related challenges and waste management systems, including how litter reduction can help maintain urban drainage systems.

### [Designing a Plastic-Free Future with Regenerative Materials](#)

This Plastic Pollution Coalition webinar focused on solutions for moving away from plastic products. Individuals from companies focused on manufacturing goods with non-plastic materials explored the landscape of plastic alternatives, including two ocean-based feedstocks, and learned how these materials are being employed for a healthier future. Panelists include: Hoa Doan, Head of Impact and Sustainability at Notpla; Renata Massion, Senior Sustainability Manager at Cruz Foam; and Baillie Mishler, Co-Founder and Design Director at PROWL Studio.

### [3M's Decades-Long Attempt to Cover-Up the "Forever Chemicals" In All Our Blood](#)

Beyond Plastics hosted a webinar featuring Sharon Lerner, an award-winning investigative journalist whose article about 3M's cover-up of the dangers of PFOS/PFAS chemicals was recently published in ProPublica and the New Yorker. Lerner explained what these forever chemicals are, how they relate to plastics and how they impact human health and the environment.

### [Uncovering the Influence of Microplastics on Disease Dynamics in a Commercially Valuable Fish and Virus System](#)

This webinar was part of the NOAA Science Seminar Series and focused on the results of a 2019 [grant](#) to the Virginia Institute of Marine Science at William and Mary University. The study investigated the effects of microplastics on the mortality of fish when co-exposed to viruses and microplastics. The study found that microplastics alone were not lethal, but mortality increased significantly when fish were exposed to virus and microplastics, especially microfibers. In following studies, the particle shape was found to be key in eliciting increased virulence, whereby fibers elicited greater response than particles of similar chemical makeup. They also found that chronic plastic exposure pre-virus was required for increased viral virulence. Watch the recording to hear about both studies from one of the lead investigators, Dr. Meredith Evans Seeley, an Assistant Professor at the Virginia Institute of Marine Science, William & Mary University.

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## The Microplastics Breakdown

### *FATE AND TRANSPORT OF MICROPLASTICS*

#### **Factors Controlling Transport Dynamics of Microplastics in Streams**

Nadia Dikareva and Kevin S. Simon

The researchers found that streams are the primary conduits for transporting microplastics from land to sea. They observed that the characteristics of the plastic particles and of the streams are both likely to influence how microplastics move, but there are few empirical studies of microplastic transport dynamics in real systems. In their study, they used the spiralling technique, a method described as being commonly used to measure nutrient cycling in streams with varying geomorphological structure and level of human modification to quantify transport distances and deposition velocities. The research team pulse released trace amounts of three size classes of five different polymers of a range of densities in 15 streams in urban environments ranging from seminatural to highly modified. The transport distance of microplastic were found to range from less than 1 meter to 111 meters, with distances declining with particle size. Neutrally buoyant polymers were found to have been transported the longest distance. Streams that had been modified into concrete channels were found to be the most effective in transporting microplastics downstream. According to the researchers, their results suggested that the physical characteristics of the stream are more determinative of the movement of microplastics than on the characteristics of the plastics. **Read the full abstract here:**

<https://pubs.acs.org/doi/abs/10.1021/acsestwater.4c00393>

### *HUMAN EXPOSURE TO MICROPLASTICS*

#### **Profusion of Microplastics in Dental Healthcare Units; Morphological, Polymer and Seasonal Trends with Hazardous Consequences for Humans**

Naseem Akhtar, Arifa Tahir, Abdul Qadir, Rehana Masood, Zain Gulzar, Muhammad Arshad

This study investigated microplastics in ten private dental offices in different settings in Lahore, Pakistan. Between February 2022 and January 2024, the researchers collected dust samples using a clean brush and steel pan from various flat and horizontal surfaces in the dental offices. Clinical dental units were found to have had fewer microplastics than teaching hospital dental units, with comparatively more abundance in winter. The most prevalent polymer type was found to be polyethylene terephthalate. Differences in the average inhalation microplastic intake risk was identified -- an average inhalation microplastic intake risk of 20.23 MP/g/day and 5259.85 MP/g/year for clinical settings and 29.45 MP/g/day and 765.12 MP/g/year for teaching hospital dental units. The researchers found that female dental professionals have 1.1 times more microplastic inhalation risks than male dental professionals. The researchers concluded that their findings underscored the urgent need for a shift towards more sustainable practices in the dental healthcare sector. They suggested that dental professionals prioritize using non-plastic material protective equipment and install and maintain a proper ventilation system to reduce exposure to these particles. **Read the full abstract here:**

<https://www.sciencedirect.com/science/article/pii/S0304389424021423>

### *MICROPLASTICS IN FOOD*

#### **Tracking Tire Plastics—and Chemicals—from Road to Plate: Auto Tires Shed Dangerous Microplastics and Harmful Chemicals. New Research Suggests that Both Can Make Their Way into Crops**

Virginia Gewin

This article focused on tire-derived microplastic pollution and outlined some of the policy efforts to address them. This category of microplastics was described as a growing source of plastic pollution and a target of the [United Nations International Plastic Treaty negotiations](#). The author referenced recent estimates that tire particles made up to 30 percent of microplastics in Germany, roughly 54 percent in China, 61 to 79 percent in Sweden, and a whopping 94 percent in Switzerland. The main discussion of the article centered around the results of a [May 2024 study](#) that was described as demonstrating for the first time that store-bought lettuce contains chemical tire additives. One or more of the 16 tire additives that were the focus of the study were found in 20 of 28 lettuce samples. As reported, the concentrations of tire additives in leafy vegetables were found to be low overall, but two compounds were most common: benzothiazole, used to strengthen rubber, was detected in 12 of the 28 samples; and 6PPD, used to prevent its oxidation, was found in seven. The precise source and pathway of these chemicals was not identified. Existing research has established that leaching from tire-wear particles is a major source of benzothiazoles in the environment, but the compound is also used in other



applications including agrochemicals and consumer products. Likewise, she observed that GPPD can be found in sporting equipment and recreation facilities. She noted that the study did not detect all the tire additives and was not able to provide the total chemical load in lettuces. She observed that the three likely pathways for the additives to the lettuce: biosolids, atmospheric deposition and recycled irrigation water. However, she asserted that none of these was identified as the most likely offender. **Read the full article here:**

<https://civileats.com/2024/07/16/tracking-tire-plastics-and-chemicals-from-road-to-plate/>

### **Preliminary Characterization of Microplastics in Beef Hamburgers**

E. Visentin, G. Niero, F. Benetti, A. Perini, M. Zanella, M. Pozza, M. De Marchi

The goal of this study was to preliminarily determine the number and the quality of microplastics diffusion in beef hamburger meat. Fourier-transformed infrared micro-spectroscopy was used to detect microplastics samples taken from ten different hamburgers produced by two Italian companies. Microplastics were detected and ranged from 200.00 to 30,300.00 microplastics/kg. The majority of the microplastics were found to mainly be irregular in shape (95.99%) and grey in color (70.16%). Also, the dimensions of the plastic were primarily between 51 and 100  $\mu\text{m}$  (57.46%). The researchers detected eighteen different polymers, with polycarbonate, polyethylene and polypropylene being the most abundant classes. They observed that their results demonstrated an extensive diffusion of microplastics in the analyzed samples, which may originate from various sources, including animal body, industrial processing and packaging. Additionally, they anticipated that their findings would help to precisely circumscribe the origin of microplastic contamination, which will then enable the design of specific guidelines to limit microplastic diffusion in processed meat products. **Read the full abstract here:**

<https://www.sciencedirect.com/science/article/pii/S0309174024002031>

### **Microplastics and Nanoplastics in Foods**

The Food and Drug Administration launched a new web page in July 2024 focused on microplastics and nanoplastics in the food supply. The page lists some key points, for example, that there is evidence suggesting that microplastics and nanoplastics are entering the food supply but there is no current scientific evidence that levels of microplastics or nanoplastics detected in foods pose a risk to human health. This page includes health effects and scientific and regulatory information. Additionally, a list of sources is included as well as links to available resources from other federal agencies. According to the page, the FDA plans to continue to monitor research on microplastics and nanoplastics. If the FDA determines, based on scientific evidence, that microplastics or nanoplastics in food, including packaged food and beverages, adversely affect human health, it can take regulatory action to protect public health. **Access the webpage here:**

<https://www.fda.gov/food/environmental-contaminants-food/microplastics-and-nanoplastics-foods>

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## **MICROPLASTICS POLLUTION REDUCTION AND MITIGATION**

### **How a Monk and a Hippo Joined Forces to Tackle Bangkok's Plastic Pollution**

Claire Turrell

This article focused on Abbot Phra Mahapranom Dhammalangkaro's efforts to clean up the Chao Praya River in Bangkok, Thailand. The Chao Phraya River is the largest and busiest waterway flowing through central Thailand and is home to critically endangered species such as the Siamese tigerfish, giant barb and Chao Phraya giant catfish. The author cited research by the Rotterdam-based non-profit organization [Ocean Cleanup](#), indicating that the Chao Praya River [carries 4,000 tons of plastic](#) waste to the sea every year. The Abbott's work began with building a recycling center on the temple grounds that over time evolved from collecting a handful of bottles to upcycling 300 tons of plastic a year. However, this did not result in cleaning up the river itself. Plastic can be washed from the land into the rivers with the rain and floods, but even facing the possibility of penalties, there are still people illegally dumping rubbish. To more squarely address the issue of plastic pollution in the river, earlier this month, the Abbot partnered with Tom Peacock-Nazil, the chief executive of [Seven Clean Seas](#) (an organization that finds solutions for plastic pollution), to launch a solar-powered boat called the Hippo to remove plastic from the river. The article described the boat as having a boom that funnels the floating plastic from the river onto a solar-powered conveyor belt. This then hauls the rubbish out of the water and drops it into a dumpster hidden under its roof. It is estimated that this boat would remove plastic at a rate of 1.4 million kilos of plastic a year. Seven Seas is hoping to partner with other communities to establish onshore infrastructure to prevent plastic entering the environment and they are also hoping to build more Hippos that would be located on other polluted rivers elsewhere in Thailand and southeast Asia. **Read the full article here:**

<https://www.theguardian.com/environment/article/2024/aug/05/thailand-bangkok-plastic-pollution-chao-praya->

## **US To Support Global Treaty Aiming to Reduce Production of Plastic: Backing from One of World's Largest Producers Will Boost Prospect of United Nations Agreement for Manufacturing Cap**

Aime Williams and Jamie Smyth

This article reported on the shift in United States policy to support the inclusion of language in the United Nations Global Treaty to limit the production of plastic. A final round of negotiations is scheduled to take place in South Korea in late November 2024. In previous UN talks earlier this year, the U.S. was aligned with China and Saudi Arabia in resisting the inclusion of plastic production controls in a treaty, instead calling for a focus on recycling and reuse. However, developing countries in Asia and Africa were reported to have been calling for the burden for the control and clean-up be placed on the plastic producers. The petrochemicals industry in the United States has criticized the UN-led efforts to cap the production of plastic. The authors noted that this policy shift was first reported by Reuters and is occurring as scientists have reported further disturbing evidence about the harmful effects of plastics. They cited the example of a recent report published in the *Annals of Global Health*, which found that “every plastic-associated chemical group” was linked to “at least one adverse health outcome”. Additionally, they pointed to existing research indicating that plastics are sources of perfluoroalkyl and polyfluoroalkyl substances, known as PFAS, which never fully degrade and build up in the environment and biological chain, including in the human body, and are linked to health risks. The U.S. was described as producing the most plastic waste per capita, with the average American estimated to be responsible for about 130 kg of plastic waste a year. The U.S. is followed by the United Kingdom, South Korea and Germany. Global demand for plastics, which makes up 50 percent of petrochemical demand, was expected to nearly double by mid-century, according to S&P Global Commodity Insights. **Read the full article here:** <https://www.ft.com/content/3ac9d411-50f9-47f2-a847-f20609c0c4aa>

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### ***MICROPLASTICS IN SOIL***

#### **Migration and Accumulation of Microplastics in Soil-Plant Systems Mediated by Symbiotic Microorganisms and Their Ecological Effects**

Xinru Li, Feng Shi, Min Zhou, Fengchang Wu, Hailei Su, Xuesong Liu, Yuan Wei, Fanfan Wang

According to this article, the coexistence of microorganisms in complex soil environments greatly affects the environmental behavior and ecological effects of microplastics. This study focused on the effects of the presence of arbuscular mycorrhizal fungi (AMF), a common symbiotic microorganism in the soil-plant system, on lettuce plants. The researchers reported that AMF was proved to significantly affect the absorption and migration of microplastics. They found that there was a “size effect.” The existence of AMF accelerated the uptake of small-sized (0.5  $\mu\text{m}$ ) microplastics into the plants, but the uptake was slower for large-sized microplastics (2  $\mu\text{m}$ ). The presence of AMF was found to exacerbate the toxicity of small-sized microplastics on lettuce (e.g., reduced plant biomass, photosynthesis, etc), and to reduce the toxic effects of larger sized microplastics (e.g., increased plant height, antioxidant enzyme activity, etc). These results were attributed to the effects of AMF on the plant root structure and on the root environment, which altered the absorption and accumulation capacity of microplastics in lettuce, which, in turn, also altered the environmental behavior and biological toxicity of microplastics. **Read the full abstract here:** <https://www.sciencedirect.com/science/article/pii/S0160412024005518>

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